REDWOOD LANDFILL
FINAL ENVIRONMENTAL IMPACT REPORT
Second Amendment

SCH No. 19911033042

May, 2008

Introduction: Purpose and Scope of the FEIR Second Amendment

This Second Amendment to the Redwood Landfill Final Environmental Impact Report (FEIR) was prepared to respond to issues raised at the Marin County Planning Commission Public Hearing held on April 28, 2008 and May 5, 2008, including written submittals to the Planning Commission, Public Testimony, and questions from Planning Commissioners, and to incorporate several additional staff-initiated changes to the FEIR to respond to new information or errata in previous documents.

This Amendment covers the following topics:

1. Mitigation Measures, Conditions of Approval, and Enforcement
2. Leachate Facilities Leak or Spill Contingency Plan (Mitigation Measure 3.4.7f)
3. Levee Stability Analyses (Mitigation Measures 3.5.6b and c)
4. Long-Term Flood Protection Plan (Mitigation Measure 3.5.6d)
5. Greenhouse Gas Reduction Plan (Mitigation Measure 3.2.5f)
6. Revised Closure and Post-Closure Maintenance Plan (Mitigation Measures 3.2.5g and 3.4.7k)
7. Reduction of Criteria Air Pollutants from Equipment and Vehicles (Mitigation Measures 3.2.2a-e)
8. Protection of California Clapper Rail (Mitigation Measure 3.3.4a)
9. Invasive Weeds (Mitigation Measure 3.4.4e)
10. Third-Party Monitoring
11. Clarification and Elaboration of the Mitigated Alternative
12. Alternatives Analysis: No Project Alternative Land Use and Planning Impacts
13. Landfill Gas Flare and Engine Emissions: Impact 3.2.5

14. Revisions to Other Mitigation Measures based on Planning Commission action in conjunction with their recommendation for certification of the Final EIR, as listed in the minutes of the May 5, 2008 hearing.

Not all topics raised at the Planning Commission Hearing are addressed in this document. County staff addressed several issues not requiring changes to the text of the FEIR at the Hearing on April 28, 2008 and May 5, 2008.

This Second Amendment includes several revisions to Mitigation Measures from the July, 2005 FEIR and the March, 2008 FEIR Response to Comments (RTC) Amendment that were prompted by questions or concerns raised at the Hearing. None of the changes fundamentally alters any of the mitigation measures, nor changes the conclusions regarding the effectiveness of the measures in reducing impacts to less than significant levels. Instead, the changes clarify or amplify mitigation measures, and in some cases alter the stated implementation schedule. New changes to the text of the FEIR are shown in underline and ~~strike-through~~ text.

Attached to this Amendment are a list of additional minor changes to the FEIR (Attachment 1) and a revision of the Mitigation Monitoring and Reporting Program (Attachment 2).

Changes requested by Planning Commissioners, as reflected in the minutes of the May, 5, 2008 hearing, and the location in this document where they are addressed, are as follows:

Requested Change	**Where Addressed**
Mitigation Measure 3.2.10c: clarify that recovered materials truck trips are included in the "vehicles carrying waste" category in Table MR104-2.	Topic 11
Mitigation Measure 3.4.1c: change "discuss" to "specify."	Attachment 1
Mitigation Measure 3.4.2a: change language at end of second paragraph to clarify intent.	Attachment 1
Mitigation Measure 3.4.4c: final bullet, remove "alternatively."	Topic 9
Mitigation Measure 3.4.7c: change trigger for control of leachate leak from "major" to "noticeable."	Mitigation measure not changed, since this is an applicant-specified measure; however, see next item.
Mitigation Measure 3.4.7f: add specific language on immediate notification of LEA and RWQCB in case a leachate leak is detected.	Topic 2
Mitigation Measure 3.4.7g: clarify language in 4th line.	Attachment 1
Mitigation Measure 3.2.5f: add provision that additional landfill capacity will be contingent on meeting specified greenhouse gas reduction requirements.	Topic 5
Mitigation Measure 3.6.4b: 2nd bullet, strike "and to offset project impacts."	See next item
Mitigation Measure 3.6.4b, 2nd bullet, change to: "The County will consider the enactment of an ordinance that would impose a mitigation fee or similar strategy on waste imported to Redwood Landfill from areas of California outside Marin County. The mitigation fee will be used to develop additional landfill capacity [offsite] and to develop diversion programs.	Topic 14
In discussion of third party monitoring, change specification of ISO 14001 to third party monitoring.	Topic 10

Issues Raised and Addressed

1. Mitigation Measures, Conditions of Approval, and Enforcement

A distinction should be drawn between mitigation measures that require the applicant to prepare and submit documentation or new studies prior to issuance of the revised Solid Waste Facilities Permit (SWFP), and those mitigation measures that directly apply to future operations and environmental controls. The former will become conditions of approval only in a general sense, in that the issuance of the permit will be conditioned on first submitting the required documentation or studies, though outcomes of the measures, such as new facilities or engineering designs identified in the required plans or studies, may become conditions to be implemented after the SWFP is issued. The mitigations that apply to future operations and environmental controls will become conditions of the SWFP or other regulatory permits. For example, Mitigation Measure 3.4.7f requires that the applicant prepare and submit, prior to project approval and issuance of the revised SWFP, a Leachate Facilities Leak or Spill Contingency Plan. Because the plan must be prepared prior to issuance of the permit, it need not become a condition of Permit implementation. The consequence to the applicant of failing to comply with this requirement would be that the LEA would not issue a revised SWFP. The requirement to construct or implement any new facilities or measures to ensure the adequacy of the landfill's leachate storage system that are identified in the plan would, however, become conditions for implementing the revised SWFP. Failure to comply with conditions of the Permit may result in enforcement action by the LEA, the CIWMB, or other regulatory agencies. Many of the Mitigation Measures in the FEIR and the FEIR RTC Amendment note when and how they would be implemented. The MMRP clearly shows which measures would be fulfilled prior to permit issuance, and which would be implemented as a condition following issuance of the revised SWFP.

The enforcement authority of the LEA is described in the FEIR, in Master Response 18:

> The LEA and the CIWMB have broad regulatory authority over landfill operations, including authority to undertake several types of enforcement actions. Statutory authority for LEA enforcement is contained in Public Resources Code [PRC] Section 43209, and CCR, Title 14, §18081 (c) and §18084. LEA enforcement policies and procedures are detailed in a CIWMB publication, *LEA Enforcement Advisory/Board Enforcement Policy*, published as LEA Advisory #38, March 17, 1997. The following discussion is based on this publication.
>
> The LEA inspects solid waste facilities periodically. Most landfills, including Redwood Landfill, are inspected monthly. At the conclusion of each inspection, the LEA issues an inspection report noting any violations (violations of permit conditions or state minimum standards) as well as any areas of concern – issues that may become violations. Upon identification of a violation, the LEA may also issue a separate Notice of Violation, underscoring the seriousness of the violation, stating or requesting a work plan to correct the violation, and informing the facility operator of the consequences of not correcting the violation.

The CIWMB and the LEAs maintain the Inventory of Solid Waste Facilities that Violate State Minimum Standards. Notification of a violation for two consecutive months will result in the CIWMB issuing the facility a 90-day Notice of Intent to place the facility in the Inventory, if the violation is not corrected. Once a facility is included in the Inventory, the LEA prepares a Compliance Schedule which is meant to ensure that diligent progress will be made to bring the facility into compliance in a timely fashion. The Compliance Schedule may stand alone, or may be issued as part of a Notice and Order. If the owner or operator of the facility fails to comply with the Compliance Schedule, the LEA is required to issue a Notice and Order, essentially a demand on the facility to correct violations or to face consequences, which may include civil penalties, seeking a court injunction, or revoking the facility's permit. LEAs may also work with the facility owner and operator to develop and agree to a Stipulated Notice and Order, to which the facility owner is signatory, which spells out the terms and schedule for correction of the violation, and which, like a Notice and Order, spells out the consequences of non-compliance. LEAs are required to coordinate where appropriate with other agencies with regulatory authority over solid waste facilities, in enforcement actions and in developing corrections.

2. Leachate Facilities Leak or Spill Contingency Plan (Mitigation Measure 3.4.7f)

Mitigation Measure 3.4.7f in the FEIR RTC Amendment states (in the last paragraph) that the Leachate Facilities Leak or Spill Contingency Plan must be completed prior to project approval and issuance of the revised Solid Waste Facilities Permit (SWFP). The plan must include calculations of the amount of leachate storage capacity needed for normal and extraordinary situations, and must specify any required new or expanded facilities to ensure adequate storage capacity. The plan must also include the results of a new survey of the existing leachate impoundment to resolve conflicting information on the capacity of this essential facility; this information will in turn inform the analysis of whether additional storage capacity is needed.

To ensure timely implementation of any necessary facilities upgrades identified in this plan, Mitigation Measure 3.4.7f is modified as indicated below to add the requirement that any specified improvements must be completed within one year of issuance of the revised SWFP. It is expected that implementation of the Leachate Facilities Leak or Spill Contingency Plan will become a condition of the revised Permit.

Mitigation Measure 3.4.7f: RLI shall update its Leachate Facilities Leak or Spill Contingency Plan to accommodate proposed project changes. At a minimum, the revised plan shall address the following issues:

(1) Areas in the Oxbow shown in the existing plan (RLI, 1995b) as the location of the contingent leachate pond (Fields 2 and 3 and the narrow strip between the eastern edge of the existing leachate pond and Field 5) are proposed under the project to be used for composting and co-composting, and Fields 3, 4, and 5 are proposed under the project to be used for composting, co-composting, and are "also available for Class II leachate impoundments." The revised leachate contingency plan shall identify which area or areas will be used for contingent leachate storage or, alternatively, explain/clarify how composting operations and emergency leachate storage will be accommodated in the same area. The updated leachate contingency plan shall

demonstrate that the compost operation shall be isolated from and not affected by use of any area as a contingency/emergency leachate impoundment. (Refer to Mitigation Measures 3.5.3a, 3.5.3b, and 3.5.3d regarding leachate potentially generated at these new composting areas.)

(2) Because an additional leachate storage/evaporation pond that, according to the 1995 Leachate Facilities Leak and Spill Contingency Plan (RLI, 1995b), was to have been constructed in the summer of 1996 to provide additional pond storage capacity, has not been constructed, yet additional capacity has been shown to be needed to prevent overflow during especially wet months, the revised plan shall indicate RLI's plans to provide additional leachate storage capacity. To address revisions to the estimates of the depth and capacity of the existing pond reflected in each of the last three annual monitoring reports, the plan shall also include an updated calculation of the capacity of the existing pond based on a survey of the pond area and depth, conducted by a licensed surveyor.

(3) With regard to potential overtopping of the leachate pond during periods of extreme rainfall, the 1995 plan indicated that pumping directly into San Antonio Creek, if leachate water was confirmed to be clean, was the most effective contingency measure to quickly evacuate the leachate pond. The updated leachate contingency plans shall not rely on such a measure for leak or spill contingencies, but shall include other contingency measures as discussed under item (1), above (i.e., identification of the location of on-site contingent impoundments), that prevent the off-site release of leachate. Any such on-site impoundment(s) designated to receive leachate shall be constructed to meet applicable state standards for leachate impoundments.

(4) The updated Leachate Facilities Leak or Spill Contingency Plan shall specify that the landfill shall notify the LEA and the RWQCB immediately upon detection of any significant leachate leak or spill.

The updated Leachate Facilities Leak or Spill Contingency Plan shall be submitted to the LEA and the RWQCB prior to project approval. Approval of use of Oxbow areas for composting, other than Field 2, where the Applicant commenced composting on a new pad in 2005, shall be conditioned upon approval of the updated Leachate Facilities Leak or Spill Contingency Plan, in addition to other relevant approvals required as mitigations in this report. All necessary improvements identified in the updated Leachate Facilities Leak or Spill Contingency Plan, including but not limited to the construction of additional Class II leachate impoundments, measures to isolate the composting facility from leachate impoundments, and any other facilities required to ensure adequate leachate storage capacity under both normal and extreme weather conditions, shall be completed within one year of issuance of the revised Solid Waste Facility Permit. Construction of such facilities will be subject to Construction Quality Assurance monitoring and reporting. Upon completion of all facilities, the applicant shall submit a report of completion to the RWQCB and the LEA.

3. Levee Stability Analyses (Mitigation Measures 3.5.6b and c)

Mitigation Measures 3.5.6b and c in the FEIR RTC Amendment address the issue of seismic and static stability of recently upgraded levees and future levee upgrades (Measure 3.5.6b) and of the repair of the levee segment that failed in December, 2006 (Measure 3.5.6c) by requiring additional engineering study of the existing plans and already-completed construction. The revised MMRP indicates that these measures are to be completed prior to Project approval and issuance of the revised SWFP.

To ensure timely completion of already-planned levee upgrades and any remedial action identified in the engineering studies required in Mitigation Measure 3.5.6b and c, Mitigation Measure 3.5.6 is further amended as follows:

> **Mitigation Measure 3.5.6a:** To ensure the site and project elements are protected from potential impacts of flooding, the applicant shall complete their planned increase in the height of the perimeter levee that encompasses the entire landfill site (i.e., the approximately 380 acres of the 420-acre Southern Area currently located within levees) to 9 feet above msl and their planned increase in the width of the perimeter levee to 10 feet prior to implementation of project elements in the Oxbow or other areas outside the permitted 223-acre landfill footprint.
>
> The applicant's Joint Technical Document (JTD) (GeoSyntec, 1998) states on page 4-21 that the perimeter levee is approximately four miles long and separates the site from adjacent sloughs. As part of the description of the existing facility (pages 5-1 and 5-2) the JTD states that the perimeter levee encompasses approximately 380 acres of the 420-acre Southern Area of the landfill property, and that the height of the perimeter levee will be increased to 9 feet above mean sea level around the entire landfill, and that the crest will be widened to 10 feet. These changes to the perimeter levee are not specified as project elements, and elsewhere in the JTD some ambiguity exists as to whether references to a perimeter levee refer to a levee around only the permitted landfill footprint (approximately 223 acres) or around the entire landfill site (approximately 380 acres of which are within existing levees). This analysis assumes that as part of the facility's existing operation, as stated on the aforementioned pages, RLI intends to increase the perimeter levee that encompasses the entire 380 acres of the 420-acre Southern Area to 9 feet above msl and to widen its crest to 10 feet.
>
> Because the base flood elevation for the 100-year storm is 6 to 7 feet ngvd (approximately equivalent to mean sea level), increasing the levee to 9 feet would protect the landfill property from the 100-year flood. Increasing the width should contribute support to the levee's stability and ability to withstand the dynamic forces of the river at flood stage. The 223-acre landfill footprint already is located outside the 100-year flood plain due to existing levees. The portion of the site outside the landfill footprint remains vulnerable to flooding until these planned changes to the perimeter levee are completed.
>
> The applicant shall prepare and adhere to a construction schedule for completion of the levee improvements specified above. The construction schedule must be prepared and submitted to the LEA prior to project approval and issuance of a revised SWFP. It is expected that the construction schedule will indicate that phased or sequenced construction is required, in order to allow consolidation and strengthening of the Bay Mud beneath the

levee (see Mitigation Measure 3.5.6b and 3.5.6c, below). The construction schedule must show that all planned improvements of the entire levee system will be completed no later than January 1, 2010, or, if phased or sequenced construction is required, completion of the first phase or sequence by this date. The first phase or sequence must include improvements to any and all parts of the perimeter levee that encompasses the entire 380 acres of the 420-acre Southern Area that are not yet at the design elevation of +9 feet msl and the design top width of 10 feet. The construction schedule shall further indicate that completion of all phases or sequences will be completed in the shortest feasible time, given the limitations of construction on Bay Mud. The construction schedule shall be peer reviewed, at the applicant's expense, by a Registered Geotechnical Engineer selected or approved by Marin County. The construction schedule shall become a condition of the revised Solid Waste Facility Permit.

Mitigation Measure 3.5.6b: The applicant shall conduct slope stability analyses of the recently completed levee upgrades to determine whether the factor of safety is adequate for static and dynamic stability. The slope stability analyses shall utilize the methods and factors recommended by GeoSyntec (2007d), and shall take into account site-specific differences in surface and subsurface conditions. The same analyses shall be applied to designs for future levee upgrades. All analyses shall be independently peer reviewed by a Registered Geotechnical Engineer at the applicant's expense and subject to approval by the LEA or, if subsequent work requires a Grading Permit, by the Marin County Department of Public Works, or, if a building permit is required, by the Community Development Agency Building and Safety Division. If analysis of the recently-completed levee sections reveals that they do not meet minimum static factor of safety and seismic performance standards, the applicant shall develop a remedial action plan for further levee improvements. Any such plan shall be independently peer reviewed by a Registered Geotechnical Engineer at the applicant's expense and subject to approval by the LEA or the Marin County Department of Public Works or Community Development Agency Building and Safety Division. The schedule for implementation of the remedial action plan shall be included in the construction schedule and subject to the same requirements specified in Mitigation Measure 3.5.6a, above.

Mitigation Measure 3.5.6c: The applicant shall re-analyze the stability analysis contained in the remedial action plan for the failed levee segment, per the recommendations of Treadwell and Rollo's peer review (Appendix F). All analyses shall be independently peer reviewed by a Registered Geotechnical Engineer at the applicant's expense and subject to approval by the LEA, or, if a Grading Permit or a Building Permit is required, by the Marin County Department of Public Works or Community Development Agency Building and Safety Division, respectively. If the new analysis reveals that the design contained in the remedial action plan does not achieve an acceptable static factor of safety and seismic performance standard, the applicant shall develop a new design for the levee repair. This may require, for example, use of higher sheet piles as a parapet wall along the creek to provide flood protection, with the earthen fill and roadway placed at a lower elevation to reduce the static load on the Bay Mud. Any new design shall be independently peer reviewed by a Registered Geotechnical Engineer and subject to approval by the Marin County Department of Public Works. The schedule for implementation of the new design shall be included in the construction schedule and subject to the same requirements specified in Mitigation Measure 3.5.6a, above.

4. Long-Term Flood Protection Plan (Mitigation Measure 3.5.6d)

This Mitigation Measure was added to address the issue of flooding due to rising sea level associated with Global Climate Change. The current design height for the improved levee system (+9 feet msl) is approximately 2 feet above the 100-year flood level. To address concerns regarding the timeline for preparation of this plan, Mitigation Measure 3.5.6d is modified as follows:

> **Mitigation Measure 3.5.6d**: Prior to ~~Within 2 years of~~ project approval, the applicant shall prepare and submit to the LEA and the San Francisco Bay Regional Water Quality Control Board a plan for long-term flood protection of the site. The plan will include a consideration of feasible options for achieving protection from the 100-year flood in the face of rising sea level and increased flood frequency and intensity. The plan shall include selection of the preferred method or methods for achieving flood protection, and both a schedule and financial assurances for their implementation. The engineering basis for the plan shall be independently peer reviewed by a Registered Geotechnical Engineer prior to submittal for approval. The plan will be drafted and then updated every 5 years during the remaining operational life of the landfill and the post-closure maintenance period to ensure that it is current with the most recent and broadly-accepted predictions for flood levels, following consultation with the U.S. Geological Survey, the San Francisco Bay Conservation and Development Commission, and other monitoring agencies that track bay and ocean levels and that may provide estimates of mean sea level rise and areas subject to future inundation. Implementation of the plan shall become a condition of the revised SWFP.

5. Greenhouse Gas Reduction Plan (Mitigation Measure 3.2.5f)

This measure was added in the FEIR RTC Amendment to ensure compliance with the County's Greenhouse Gas Reduction Plan, which the Board of Supervisors adopted in 2006, after publication of the FEIR. As originally written, the Mitigation Measure gives the applicant up to two years after project approval to prepare and submit a Greenhouse Gas Reduction Plan that achieves specific targets. To address concerns regarding the timeline for preparation and implementation of this plan, and also to address concerns expressed about the greenhouse gas generation implications of continuing to landfill putrescible organic materials or use such materials as alternative daily cover, Mitigation Measure 3.2.5f is modified as follows:

> **Mitigation Measure 3.2.5f:** Prior to ~~Within two years of~~ project approval, the applicant will develop a Greenhouse Gas Reduction plan that demonstrates how the landfill will achieve by 2020 a reduction in annual GHG emissions such that emissions are no greater than 15 percent below 1990 levels. This will include but is not limited to development of additional landfill gas-to-energy production capacity; use of alternative fuels in on-site equipment and in truck fleets, ~~increased diversion of organic material from landfill disposal and use as landfill cover material,~~ increased recycling, and development of other on-site renewable energy generation capacity. For emission reductions that cannot feasibly be achieved through on-site measures, the plan may specify purchase of off-site ~~, and~~ carbon

credits ~~offsets~~ that are verified and listed with the California Climate Action Registry. The plan will include specific measures and a timeline for reducing the landfilling and use as landfill cover material of putrescible organic material. This will include, but is not limited to, phasing out the use of raw greenwaste and sewage sludge as alternative daily cover material, reducing the landfilling of sewage sludge, food waste, and other materials with a potential for high methane generation, and cooperative programs with waste collectors, individual municipalities, and joint powers authorities to increase source separation of organic materials for composting. The plan will include cost estimates for plan implementation ~~GHG reduction measures~~ and will identify funding sources, including but not limited to tip fee increases. The plan shall include an implementation schedule that demonstrates compliance with the following interim and final targets:

By 2010: Greenhouse gas emissions reduced by 15% below annual baseline;

By 2015: Greenhouse gas emissions reduced by 25% below annual baseline;

By 2020: Greenhouse gas emissions reduced to 15% below 1990 levels;

Beyond 2020: Greenhouse gas emissions not to exceed 15% below 1990 levels.

~~substantial GHG emission reductions prior to the 2020 deadline, including implementation of "early action" measures that may be implemented within two years of plan approval.~~ The plan will include an updated inventory of ~~projected~~ lifecycle GHG emissions including ~~and~~ an updated estimate of GHG emissions in 1990 and each year thereafter. The updated inventory shall constitute the annual baseline for the purpose of determining the above-stated targets. The plan will be updated and submitted for review and approval at least every 5 years. The plan will be subject to review and approval by Marin County Community Development Agency and the Bay Area Air Quality Management District.

Because the release of GHG emissions has been identified as a potentially significant impact associated with the expansion of landfill capacity, the increase in the permitted capacity, as part of the project, will be contingent upon meeting the above GHG reduction requirements. The total additional capacity granted under the Mitigated Alternative is 5.9 million cubic yards (without final cover), and will be granted contingent upon other project conditions.

6. Revised Closure and Post-Closure Maintenance Plan (Mitigation Measures 3.2.5g and 3.4.7k)

These measures were added in the FEIR RTC Amendment to address the issue of potential environmental hazards associated with generation of leachate and landfill gas beyond the currently-specified post-closure maintenance period of 30 years.

California Code of Regulations (CCR) Title 27 requires that landfill operators prepare, submit, and implement a Closure and Post-Closure Maintenance Plan. The Preliminary Closure and Post-Closure Maintenance Plan must be submitted at the time of application for each SWFP review or revision (California Code of Regulations (CCR) Title 27 § 21780(c)(1)). The Final Closure and Post-Closure Maintenance Plan must be submitted two years prior to the anticipated date of closure (CCR Title 27 § 21780(c)(3)). Standards for Closure and Post-Closure Maintenance Plans

are contained in California Code of Regulations, Title 27, §§ 20950 and 21790 et seq. Requirements for financial assurances of funds sufficient for closure and post-closure maintenance (and also for operating liability and for corrective action) are included in Title 27, Chapter 6 (§ 22200 et seq). Mitigation Measures 3.2.5g and 3.4.7k specify that the applicant provide financial assurances for an "indefinite" post-closure maintenance period. Therefore, the financial assurance must be in the form of a financial instrument that provides funding indefinitely, and not in a lump sum. In order to clarify that financial assurances must be consistent with the requirements of Title 27, Mitigation Measures 3.2.5g and 3.4.7k are modified as follows:

Mitigation Measure 3.2.5g: Following closure of the landfill, the applicant shall continue to operate, maintain, and monitor the landfill gas collection and treatment system as long as the landfill continues to produce landfill gas, or until it is determined by the BAAQMD that emissions no longer constitute a considerable contribution to greenhouse gas emissions, whichever comes first. Because the landfill will continue to produce substantial quantities of landfill gas well beyond the 30-year post-closure maintenance period specified in the JTD, the applicant shall prepare a revised Preliminary Post-Closure Maintenance Plan that plans for and provides financial assurances for operation, maintenance, and monitoring of the landfill gas collection and treatment system for an indefinite period. Financial assurances shall meet the requirements of California Code of Regulations Title 27, Chapter 6, and shall be sufficient for the entire cost of closure and post-closure maintenance.

Mitigation Measure 3.4.7k: Following closure of the landfill, the applicant shall continue to operate and maintain the LCRS, including extraction of fluid from the LCRS trench and from interior wells. To demonstrate the effectiveness of the LCRS post-closure, the applicant shall verify that one of the following conditions is met:

1) Demonstrate that the piezometric head in the basal (laterally continuous) leachate is no greater than 1 ft MSL;

2) Demonstrate that the extracted leachate is chemically indistinguishable from the groundwater in the vicinity of the landfill.

Until it can be demonstrated that condition 2 is met consistently over a 3-year period, the applicant shall continue to operate and maintain the LCRS, and to maintain and monitor the sand channel and Pleistocene Alluvium monitoring wells at the site. Because it may be necessary to continue to operate and maintain the LCRS and to monitor wells beyond the 30-year post-closure period specified in the JTD, the applicant shall prepare a revised Preliminary Post-Closure Maintenance Plan that plans for and provides financial assurances for perpetual maintenance of these environmental control and monitoring systems. Financial assurances shall meet the requirements of California Code of Regulations Title 27, Chapter 6, and shall be sufficient for the entire cost of closure and post-closure maintenance.

7. Reduction of Criteria Air Pollutants from Equipment and Vehicles (Mitigation Measures 3.2.2a-e)

The Planning Commission received comments regarding additional measures to reduce criteria air pollutants from landfill equipment and from vehicles hauling materials to and from the facility. Such measures are described in Mitigation Measures 3.2.2 and 3.2.8 in the FEIR, and further refined in the FEIR RTC Amendment by revising Mitigation Measure 3.2.2c and adding Mitigation Measure 3.2.2e. The suggestion to require exhaust filters (particulate traps) is already included in Mitigation Measures 3.2.8c and 3.2.8d (FEIR page 3.2-46). Mitigation Measures 3.2.2c and 3.2.2d is further refined as follows:

> **Mitigation Measure 3.2.2c:** As off-road equipment ages and requires replacement, the project applicant can be expected to purchase new equipment that incorporates technology that meets more stringent emission standards mandated by CARB. Alternatively, the project applicant may purchase electrically-powered equipment, or equipment fueled by an alternative, less-emitting fuel (e.g., liquefied natural gas [LNG] or compressed natural gas [CNG]). Use of alternative fuel engines can be expected to achieve a reduction in NO_x emissions of at least 37 percent. At the time of replacement, the applicant shall purchase new equipment that meets then-current emission and pollution control standards. Older equipment still in use at the site that does not meet new CARB standards shall be fitted with diesel particulate traps and fueled with a biodiesel blend to reduce particulates and other pollutants.
>
> **Mitigation Measure 3.2.2d:** As collection vehicles are replaced, the project applicant, including other Waste Management affiliates that regularly haul materials to Redwood Landfill, shall comply with CARB's Solid Waste Collection Vehicle Fleet Rule (contained in Title 13, California Code of Regulations, Sections 2020, 2021, 2021.1, and 2021.2) adopted in September 2003 to address diesel particulate matter. The project applicant shall give preference to add-on technologies or control measures (such as fleet conversions) that also reduce NOx emissions, while meeting necessary BACT requirements. The types of control measures that may be implemented include such measures as converting their collection fleets to vehicles that operate on alternative, low-emission fuels (such as CNG, LNG, or biodiesel) use of particulate traps, or modification or replacement of diesel engines to reduce NOx emissions, by such measures as incorporating exhaust gas recirculation (ERG) systems and/or stratified combustion chambers, and/or by using ultra-low sulfur fuel and fuel additives.

8. Protection of California Clapper Rail (Mitigation Measure 3.3.4a)

Testimony received at the Planning Commission hearing from local experts indicate that the buffer distance specified in Mitigation Measure 3.3.4a is not consistent with the most recent research on the subject, and that the buffer distance should be selected in consultation with the U.S. Fish and Wildlife Service. Therefore, Mitigation Measure 3.3.4a is amended as indicated below. This measure is also amended to change instances of the use of "should" to "shall;" however, this change is only for the purpose of clarification, and does not affect the mandatory nature nor the enforceability of this or any other mitigation measure in the FEIR.

Mitigation Measure 3.3.4a: Levee reconstruction work during the California clapper rail nesting season (February 1 – August 31) shall be avoided, unless surveys by a qualified biologist with a current federal scientific take permit for California clapper rail indicate that California clapper rails are not nesting within ~~700~~ 750 feet of the work area, or another distance determined in informal consultation with the U.S. Fish and Wildlife Service. The surveys ~~should~~ shall be conducted consistent with the current U.S. Fish and Wildlife Service survey protocol for California clapper rail. Furthermore, the surveys ~~should~~ shall be conducted to determine the pair status of any observed individuals, local habitat use, and location of nests (if any) to within at least 30 feet. If nesting California clapper rails are found or ~~highly~~ suspected, one of the following measures ~~should~~ shall be implemented:

(a) No construction activities ~~should~~ shall be conducted within ~~700~~ 750 feet of a known or suspected California clapper rail nest or within another distance determined in informal consultation with the U.S. Fish and Wildlife Service; or

(b) Construction activities that must occur within ~~700~~ 750 feet (or another distance determined in informal consultation with the U.S. Fish and Wildlife Service) of a known or suspected California clapper rail nest ~~should~~ shall ~~not~~ be conducted only ~~until~~ between September 1 and January 31.

9. Invasive Weeds (Mitigation Measure 3.4.4e)

Comments from Planning Commissioners included concern regarding potential flaws in the wording of Mitigation Measure 3.4.4e. This measure is therefore revised as follows:

Mitigation Measure 3.4.4e: To ensure that raw yardwaste used for erosion control on landfill side slopes does not become a source for the spread of invasive weed species into the adjoining marsh, Redwood Landfill shall undertake an invasive weed monitoring and control program. At the least, this program will consist of the following:

1. Prior to project approval, the applicant shall c~~C~~onduct a baseline survey of areas of the landfill where yardwaste has been applied for erosion control, and of the perimeter of the landfill, to determine the presence and extent of invasive weed species already established, if any;

2. Prior to project approval, the applicant shall r~~R~~emove invasive weeds that have become established on the landfill property

3. The applicant shall continue to ~~and~~ monitor annually for presence of invasive weeds, and continue removal as necessary;

~~3. If after monitoring it is determined that use of raw yardwaste for erosion control at the site is not a source of invasive weed species, the frequency of monitoring may be reduced and/or the control program discontinued.~~

4. ~~Alternatively~~ In addition, Redwood Landfill could ~~may~~ substitute composted or heat-sterilized yardwaste that does not contain viable weed seeds for raw yardwaste.

10. Third Party Monitoring

As stated in Master Response 111 in the FEIR RTC Amendment (page 2-67), because the FEIR does not identify a significant impact related to the landfill's existing monitoring program, there is no legal basis under CEQA to impose a third party monitoring program as mitigation. As noted, however, the LEA may at its discretion require such a program as a condition of approval of the revised SWFP, if it finds there is a legitimate public interest to do so. The LEA may, for example, consider addition of the following conditions of the revised SWFP, if it finds there is a legitimate public interest for doing so:

1. The landfill would be required to seek ISO 14001 registration, including certification by an independent third party monitor. The results of the annual certification audit would be made public.

2. All engineering designs and plans would be independently peer reviewed by a competent professional upon submittal to the LEA and other regulatory agencies. Peer reviews would be at the applicant's expense and would be conducted by an individual or firm selected or agreed to beforehand by the LEA.

3. The applicant would implement a Construction Quality Assurance (CQA) program for construction of all environmental control facilities, including but not limited to:

   – Levee improvements;
   – LCRS components;
   – Stormwater control facilities;
   – Landfill gas system components.

   A CQA program description would be prepared and submitted to the LEA prior to project approval. Implementation of the CQA would become a condition of the revised SWFP.

4. Following issuance of the revised SWFP, Redwood Landfill would prepare and submit to the LEA an annual report of compliance with all permit conditions of all permits under which the landfill operates. The annual report would include summary or full versions of all other required reports (such as monitoring reports) for all permits and all correspondence with regulatory agencies. The annual report would be due within three months of the end of the calendar year.

5. The LEA may include as a condition of the SWFP another requirement for third party monitoring or third party oversight of the landfill's self-monitoring program.

11. Clarification and Elaboration of the Mitigated Alternative

For clarification, Table MR104-2 in the FEIR RTC Amendment is modified as follows:

TABLE MR104-2
MITIGATED ALTERNATIVE TRIP GENERATION

Vehicle Type	Daily Totals	
	Vehicles	Vehicle Trips
Mitigated Alternative		
Vehicles Carrying Waste (including materials for reuse, recycling, and composting, and for shipping recovered materials from the site)	512	1,024
Other Vehicles (*Employees, Visitors and Deliveries*)	50	100
Subtotal	562	1,124
Construction Traffic (*seasonal*)	100	200
Total Proposed Traffic	**662**	**1,324**
Existing		
All Vehicles (Carrying Waste, Employees, Visitors and Deliveries)	415	830
Construction Traffic (expired 2002)	0	0
Total Existing Traffic	**415**	**830**
Net New		
Landfill and Recycling Operations	147	294
Construction Traffic (*seasonal*)	100	200
Total	**247**	**494**

SOURCE: ESA, Marin County

In addition, the following is added to the description of the Mitigated Alternative in Master Response 104 in the FEIR RTC Amendment:

- The Mitigated Alternative includes development of materials and energy recovery facilities consistent with local land use and other policies and ordinances, as described on pages 2-14 and 2-16 of the FEIR RTC Amendment. The type, capacity, and design of such facilities will be specified in a revised application for a Solid Waste Facility Permit, and shall include an analysis of current and projected future markets for recovered materials.

12. Alternatives Analysis: No Project Alternative Land Use and Planning Impacts

In order to reflect new information on remaining landfill capacity and site life (see Master Response 107 in the FEIR RTC Amendment), the analysis of the No Project Alternative's Land Use and Planning impacts presented in the FEIR (FEIR Volume 1, Chapter 5) is revised as follows:

Land Use and Planning

As ~~suggested in the FEIR Land Use and Planning section and demonstrated in FEIR Master Response 21~~ discussed in Master Response 107 and shown in Table MR104-4 in the FEIR RTC Amendment, the landfill under the N~~n~~o P~~p~~roject scenario could reach capacity as

early as ~~in~~ the year ~~2024~~ 2016. This is less ~~more~~ than Marin County's 15-year capacity standard and thus is not consistent with the County planning goal of providing for at least 15 years of landfill capacity. ~~Because this alternative provides fewer years of landfill capacity than does the project, the impact is less favorable (greater) than the project.~~ Neither does t~~T~~his alternative ~~does not~~ advance ~~the~~ County Summary Plan Goal 12 or Policy 14 regarding ~~of~~ develop~~ing~~ment of adequate household hazardous waste programs for county residents (see Impact 3.6.5). However, battery and motor oil drop off is already provided at the landfill, and ~~because this alternative does not involve the development of *any* new waste management programs, options, or disposal capacity while excluding HHW programs,~~ the impact with respect to th~~ese~~is goal~~s~~ and policy~~ies~~ is considered insignificant. Under the No Project Alternative, the landfill would not develop new composting, recycling, or reuse programs, and so would be in conflict with Source Reduction and Recycling Element goals 1, 6, and 9. While the project as proposed would also be in conflict with these goals (Impact 3.6.4), the impact can be mitigated to less than significant with the implementation of Mitigation Measures 3.6.4a and 3.6.4b, which would require the development of new recovery facilities and programs. These provisions for increasing waste diversion are also included in the Mitigated Alternative, but would not be a part of the No Project Alternative. Because the No Project Alternative conflicts with Countywide Integrated Waste Management Plan goals and policies, including policies regarding maintenance of 15 years of landfill capacity, and policies regarding development of reasonable and feasible waste diversion measures, the No Project Alternative would have a greater impact on Land Use and Planning than the project as proposed.

13. Landfill Gas Flare and Engine Emissions: Impact 3.2.5

The discussion of Impact 3.2.5 in the FEIR concludes that, because insufficient information was available at that time to establish baseline or project-related emissions of criteria air pollutants from the landfill's flare system, the actual increase in project-related emissions above baseline could not be calculated. Though the mitigation measures specified in the FEIR were considered likely to reduce the severity of the impact and make the project more consistent with Countywide Plan policies, without specific information on flare emissions the potential remained for a significant unavoidable impact. After publication of the FEIR, the applicant provided additional information on current and projected flare emissions, and the FEIR RTC Amendment presents this information in Table O-12, on page 3-122, and in revised Table 3.2-6, on page 3-123[1]. These tables show that increased emissions of criteria air pollutants from the flare that would occur as a result of the project as proposed would not themselves exceed BAAQMD thresholds, though they would contribute to the project's overall increase in ROG, NOx, and PM-10 above significance thresholds (see Impact 3.2.11 in the FEIR). The discussion of greenhouse gas (GHG) emissions in Master Response 112 in the FEIR RTC Amendment also indicates that the projected increase of

[1] An error occurred in the FEIR RTC Amendment, in which incorrect values from Table O-12 were carried into Table MR104-3: the values shown in Table MR104-3 for flare emissions are stated as pounds per day, but in fact the tons per year figures were carried over from Table O-12. The correct pounds per day figures for flare emissions are shown in Table O-12.

GHG emissions from landfill gas would be significant[2], and that Mitigation Measures 3.2.5f and 3.2.5g, which are added in the FEIR RTC Amendment, are necessary to reduce GHG emissions to less than significant.

The FEIR RTC Amendment includes a more detailed description of the power generation aspects of the Mitigated Alternative, including increased use of power-generating engines that run on landfill gas. Use of such engines was proposed by the applicant as part of the project, and affirmed in Mitigation Measures 3.2.5c and 3.2.5e in the FEIR. The Mitigated Alternative postulates adding engines to maximize power generation potential from landfill gas. Since publication of the FEIR RTC Amendment, the applicant has provided additional information on likely emissions from power generation engines.[3] This information is based on the level of emissions permitted by the BAAQMD for a similar power generation facility located at Altamont Landfill in Alameda County. The new information is presented below, in Table 3.2-6a, which projects emissions for a 5 megawatt (mW) internal combustion engine (ICE) installation, as proposed by the applicant, and for a 13 mW system, as specified in the Mitigated Alternative description in Master Response 104 in the FEIR RTC Amendment. Both sets of figures are "scaled up" from the permitted level of emissions for the Altamont installation, which has a capacity of 1.3 mW. This table indicates that emissions from engines used for power generation from landfill gas could be higher than emissions from flaring. As the table shows, use of ICEs would result in an increase in ROG, NOx, and CO above BAAQMD significance thresholds for the larger system specified in the Mitigated Alternative, but the smaller system would likely have emissions below significance thresholds. Because the FEIR concludes that Impacts 3.2.5 and 3.2.11 are significant and unavoidable, the emissions associated with the use of power-generating engines under the Mitigated Alternative or the project as proposed are not new or more severe significant impacts. Furthermore, BAAQMD regulations require that the landfill offset ROG and NOx emissions, and it can be expected that such requirements will be specified in the permits for the new power generation system. Additionally, emissions offsets could be credited to the power generation facility, to the extent that it would offset the need for power generation elsewhere.

Table 3.2-6a is added in its entirety, but to make it more legible, it is not underlined to indicate added text.

2 An error occurred in the FEIR RTC Amendment in Appendix E, Greenhouse Gas Emissions Calculations. Appendix table E-2 is labeled as emissions related to current permit conditions, but in fact shows emissions related to conditions under the Mitigated Alternative.

3 Personal communication (e-mail) from Osha Meserve (Counsel to Redwood Landfill) and Pat Sullivan, SCS Engineers, to Dan Sicular, re: ICE Emissions, May 15, 2008), and subsequent phone conversations between Dan Sicular and Osha Meserve, and Dan Sicular and Pat Sullivan, May 19, 2008.

TABLE 3.2-6a
EMISSIONS FROM COMBUSTION OF LANDFILL GAS

Pollutant	Current Permit Flare Emissions* (lbs/day)	Project Flare Emissions* (lbs/day)	Project Gas-Fired Engines (5 mW system)** (lbs/day)	Mitigated Alternative Gas-Fired Engines (13 mW system)** (lbs/day)	Increase (project flare vs current permit flare) (lbs/day)	Increase (project engines vs current permit flare) (lbs/day)	Increase (Mitigated Alternative engines vs. current permit flare) (lbs/day)
NOx	205	245	229	596	40	24	**391**
CO	700	833	802	2,085	132	101	**1,384**
VOC/ROG/POC	48	57	84	218	9	36	**171**
PM10	58	69	38	99	11	-20	41
SOx***	484	577	577	577	94	94	94

Key: **Bolded** values are in excess of applicable standard
mW: Megawatt

* Flare emissions from FEIR RTC Amendment (Tables MR104-3 and O-12)
** Engines emissions derived from BAAQMD BACT levels for LFG-fired engines at Altamont Landfill.
*** SOx emissions are same for engine or flare because they both convert sulfur in LFG to SO2 (425 ppmv TRS in BAAQMD permit)

SOURCE: SCS Engineers

14. Revisions to Other Mitigation Measures

In response to comments received, two other mitigation measures are modified for clarification, as follows:

Mitigation Measure 3.6.4b: The following measures will be required as conditions of a revised Solid Waste Facilities Permit, or through other actions, as noted:

- RLI will be required upon issuance of the revised Solid Waste Facilities Permit (SWFP) to implement additional diversion programs at the landfill, such as construction and demolition debris recovery, recovery of materials from self-haul and debris box loads, salvage of building materials and other reusable items, increased opportunity for drop-off of source-separated materials, and other measures as detailed in the Mitigated Alternative, ~~(see Chapter 5)~~ consistent with the goals of the County's Source Reduction and Recycling Element as well as Goal PFS-4 and its associated policies and implementing programs in the Countywide Plan Update (see Table 1.2 in the FEIR RTC Amendment). Prior to project approval, the applicant shall prepare an implementation schedule for these programs that demonstrates that all new and improved facilities will be operational within 3 years of issuance of the revised SWFP. The implementation schedule shall be included in the revised SWFP as a condition of approval;

- The County will consider the enactment of an ordinance that would impose a mitigation fee or similar strategy on waste imported to Redwood Landfill from areas of California outside Marin County. The mitigation fee will be used to develop additional landfill capacity in another location, and to develop new or expanded waste diversion programs., ~~and to offset other project impacts, including significant,~~

~~unavoidable air quality impacts (see section 3.2, Air Quality and Chapter 4, Cumulative Impacts).~~

Mitigation Measure 3.9.3b: Implement Mitigation Measures 3.2.5c and 3.2.5e (apply for an authority to construct power generation engines with a capacity to produce four to five megawatts of power within two years of concurrence on the revised SWFP by the CIWMB, and apply for a Permit to Operate the engines.) Consistent with County policies regarding best energy management practices, RLI shall commence operation of these engines as soon as allowed by the Bay Area Air Quality Management District ~~possible~~. The experience of other landfills indicates that electricity generated by the landfill gas could replace (partly or entirely) electricity currently provided by PG&E, and eventually (if not immediately) provide sufficient power to be sold to offsite users. The use of landfill gas to provide for the facility's electricity needs would serve to offset partly the increased consumption of diesel fuel for project operations.

The applicant also shall install additional power generation engines in order to offset some use of the LFG flare. Currently, use of the flare is required to abate the emission of all collected LFG. ~~except the relatively small amount used by the leachate vaporator, as well as to destroy the vapor produced by the vaporator.~~ The flare also could potentially be used to destroy exhaust emissions from ~~the vaporator and the future~~ power generation engines. However, rather than using the flare at full capacity as the generation of LFG increases, an increasing share of LFG shall ~~could~~ be diverted to generate additional electrical power if additional generation engines were installed. Even with the additional power generation engines installed, some use of the flare ~~will~~ may continue to be required. ~~, for final destruction of leachate vapor as well as for destruction of combustion exhaust emissions from the vaporator and, potentially, from the power generation engines.~~ However, operation of additional power generation engines ~~potentially~~ would provide a more productive use of much of the collected LFG than simply flaring it. Prior to project approval, the applicant shall prepare a schedule, based on projected landfill gas generation rates, for the installation of additional power generation capacity. This schedule shall become a condition of the revised SWFP.

FEIR SECOND AMENDMENT ATTACHMENT 1
Additional Minor Changes to the FEIR

The following additional minor text changes are made to the Final Environmental Impact Report Response to Comments Amendment. Additions to text in this section are underlined, and deletions to the text are indicated with ~~strike-through~~ lines.

Mitigation Measure 3.1.6c: RLI shall update as necessary and implement its current litter-control program ~~as necessary~~ to ensure compliance with 27 CCR §20830. The updated program will take into account the use of the waste tipper and the increase in incoming waste and composting receipts, and will indicate the means to prevent litter from escaping the Oxbow area proposed for composting. Measures may include, but are not limited to, the following:

- use of additional portable litter fencing in the Oxbow area,
- use of higher temporary fences at the working face, as needed to prevent litter from escaping when loads are emptied by the tipper, and
- increasing the staff of the daily clean-up crew to adequately police the additional areas proposed for composting.

RLI shall submit the updated litter control plan to the LEA for approval prior to project implementation.

Mitigation Measure 3.2.4: The project applicant shall develop and implement an Operational Dust Mitigation Plan/Program, in conjunction with the BAAQMD and the LEA that would achieve at a minimum a dust control efficiency of about 75 percent. Upon completion, the Plan shall be subject to BAAQMD review and approval. Components of the Plan should include:

- A watering program consistent with current practices. On dry days, apply water to unpaved driving surfaces at least once every three hours, and to parking areas and infrequently used unpaved surfaces, the active landfill face, active stockpile areas, or other dust prone areas at least twice daily. Apply water to composting operations areas once or twice daily, as needed. On rainy days, apply water to these areas as necessary to reduce visible emissions.
- Use of a chemical palliative or dust suppressant to reduce fugitive dust emissions from vehicle travel surfaces. Some chemical stabilizers can contain a considerable fraction of hydrocarbons, and should be selected judiciously. The choice of chemical palliative shall be made with the approval of the RWQCB, BAAQMD, and the LEA.

- Posting signs at the site that limit traffic speeds on unpaved roads to 15 miles per hour.

- Sweeping daily with water sweepers all paved access roads and parking areas.

- Appoint a designated person to oversee implementation of the Operational Dust Mitigation Plan, and make them responsible for ensuring that the Plan is fully implemented.

Mitigation Measure 3.2.9b: The project applicant shall formulate an Odor Impact Minimization Plan in accordance with the recently revised State composting regulations (Title 14 CCR § 17863.4.) This plan will be submitted to the LEA as part of the application for a solid waste facilities permit for the expanded composting facility and implemented upon issuance of the revised SWFP. In accordance with the above-cited regulations, the plan shall contain, at a minimum:

- an odor monitoring protocol which describes the proximity of possible odor receptors and a method for assessing odor impacts at the locations of the possible odor receptors; and,

- a description of meteorological conditions effecting migration of odors and/or transport of odor-causing material off-site. Seasonal variations that effect wind velocity and direction shall also be described; and,

- a complaint response protocol that includes the immediate notification of BAAQMD Compliance & Enforcement Division and County LEA staff upon receipt of any odor complaints and the provision of the BAAQMD odor complaint hotline number (1-800-334-ODOR [6367]) to complainants upon receipt of their call; and,

- a description of design considerations and/or projected ranges of optimal operation to be employed in minimizing odor, including method and degree of aeration, moisture content of materials, feedstock characteristics, airborne emission production, process

- water distribution, pad and site drainage and permeability, equipment reliability, personnel training, weather event impacts, utility service interruptions, and site specific concerns; and,

- a description of operating procedures for minimizing odor, including aeration, moisture management, feedstock quality, drainage controls, pad maintenance, wastewater pond controls, storage practices (e.g., storage time and pile geometry), contingency plans (i.e., equipment, water, power, and personnel), biofiltration, and tarping.

Mitigation Measure 3.4.1c: The applicant shall update the existing Post Earthquake Inspection and Corrective Action Plan to reflect current understanding of ground motion and seismicity in the Bay Area, to address changes to the landfill site resulting from the proposed project, and to reflect geotechnical analyses conducted for the proposed project. The understanding of earthquake probabilities, predicted ground motion, the attenuation of seismic waves, and other aspects of seismology has advanced since the facility's current plan was written in 1995, and the plan shall be revised to reflect this new understanding. Consistent with the current plan, the revised plan shall require immediate inspection and repair of earthquake damage to the landfill slopes, perimeter levees, groundwater wells, and

the LCRS. The measures to repair earthquake damage as developed in the revised Post Earthquake Inspection and Corrective Action Plan shall be submitted to the RWQCB for approval and become part of the project. The updated plan also will specify ~~discuss~~ contingency measures in the event that Redwood Landfill is unusable or inaccessible as a result of a major earthquake in the vicinity.

Mitigation Measure 3.4.2a: The applicant has developed and will utilize criteria for monitoring the lateral and vertical deformation of Bay Mud during fill placement to provide advance warning of potential instability. If the geotechnical monitoring program indicates an increasing rate of deformation in the monitored slopes, filling activity will stop at impacted areas. The applicant also has developed and will utilize criterion for monitoring pore pressures following fill placement to confirm that sufficient consolidation is achieved prior to placement of the next fill lift (GeoSyntec, 1997b).

GeoSyntec recommends staged placement of refuse due to the low strength of the underlying Bay Mud. Based upon results of analyses, GeoSyntec developed an observational approach to monitor the stability of the waste fill at the site (GeoSyntec, 1997b). Geotechnical monitoring consists of installing, monitoring, and collecting data from inclinometers and piezometers. Currently there are 10 inclinometers (numbered I-6 through I-15) and 14 piezometers (numbered P-7 through P-10, P-13 through P-17, P-20, P-21, P-23, and P-24) at the site. Based on the results of collected field data, modification to the fill-sequencing plan may be needed. The modification may consist of limiting refuse placement in certain areas to restrict slope deformations, or taking advantage of stronger foundation conditions by increasing fill in these areas. However, such modifications shall not in any case alter the overall approved landfill capacity or final grades.

GeoSyntec provides quantitative criteria to evaluate when the results of the inclinometers and piezometers indicate a slope failure may occur and filling should stop. These criteria, shown in Table 3.4-4, are based on the ratio of vertical and lateral deformations as provided by inclinometer readings and the rate of excess pore pressure generation for refuse placed as provided by piezometers. The frequency of monitoring and reporting that is included in the geotechnical monitoring program shall occur quarterly, unless the RWQCB or the LEA determines that more frequent monitoring is needed, and will follow that the frequency indicated in the WDRs and/or the SWFP.

Mitigation Measure 3.4.4a: RLI will maintain and implement a Storm Water Pollution Prevention Plan (SWPPP) as required under their storm water discharge permit. The SWPPP will provide necessary Best Management Practices that shall be implemented at the site to control storm water runoff and reduce erosion.

RLI prepared a SWPPP (RLI, 2003) for compliance with Provision C.2 of the General Industrial Storm Water Discharge Permit issued by the State Water Resources Control Board (SWRCB) and enforced by the Regional Water Quality Control Board (RWQCB), San Francisco Bay Region. In addition, the landfill was designed in accordance with CCR Title 27, §20365, which (as outlined above) specifies requirements and performance standards for precipitation and drainage control for active Class III landfills (GeoSyntec, 1998).

Mitigation Measure 3.4.4d: Prior to project implementation the applicant shall update the facility's SWPPP as needed to accurately reflect existing conditions and features and shall

implement the plan upon project approval. Because Area G is to be developed as a disposal cell, the remaining 1/2 acre stormwater pond in this area, referenced in the 2003 revision of the SWPPP, will eventually be eliminated; such change shall be addressed in a timely revision of the SWPPP. ~~.~~As required by NPDES provisions, the revised SWPPP shall be kept on site and made available to RWQCB staff upon request.

Mitigation Measure 3.4.7g: To more clearly demonstrate the effectiveness of the LCRS perimeter trench, RLI shall implement a continuous hydraulic gradient monitoring program, through at least one above-average wet season, ~~or~~ and until a gradient toward the trench is consistently demonstrated ~~(whichever occurs later)~~, through the use of automatic devices to measure and record water level (water level loggers) as described herein. All such devices will be set to record a measurement at least every 15 minutes:

- Water level loggers shall be installed and maintained at each of the transects currently established to monitor hydraulic gradient.

- A piezometer transect consisting of one piezometer located within the landfill (inboard of the trench), one piezometer within the perimeter trench, and one piezometer outboard of the trench shall be constructed in landfill Area F, which currently does not have such a piezometer cluster. Water level loggers shall be installed and maintained in the newly constructed piezometers and set for continuous monitoring.

- Water level loggers shall be installed and maintained in sand channel monitoring wells G-18, MWH-24, MWH-9 and piezometer P-2R.

- Water level loggers (or stage recorders) shall be installed and maintained in San Antonio Creek and one of the sloughs adjacent to the landfill footprint.

RLI shall compile data recorded by the water level loggers and notify the LEA and RWQCB within 14 days in the event that monitoring indicates a gradient away from the trench. If monitoring indicates a consistent gradient toward the trench, monitoring results shall be reported as part of the facility's annual Leachate Management and Monitoring Report.

If monitoring reveals evidence of a gradient away from the trench, RLI shall evaluate the potential cause(s) of the reversed gradient and implement measures to remediate the problem and provide a consistent gradient toward the LCRS trench. RLI and its geotechnical consultant, GeoSyntec, have proposed the following remedial measures if monitoring indicates a gradient away from the trench (RLI and GeoSyntec, 2006). Remediation measures may include, but would not be limited to, the following:

- Grading and surface water control features shall be observed to assess the possibility that surface water infiltration has occurred. RLI shall implement additional grading, piping, or other surface water control features if deemed necessary.

- Pump inlets shall be lowered at the two nearest sump locations to increase the gradient and associated discharge within the trench.

- If the two preceding measures do not result in resumption of a demonstrated inward gradient (toward the LCRS trench), RLI shall install and connect to the existing system an additional trench sump and discharge system.

- If none of the above measures result in a resumption of demonstrated inward gradient toward the LCRS trench, RLI shall seek approval from the RWQCB to address the situation through an engineered solution such as deepening the extraction trench or constructing a subsurface cut-off wall.

In addition, if an outward gradient is detected, RLI shall seek direction from the RWQCB to determine whether additional water quality or water level monitoring locations or methods are required.

FEIR SECOND AMENDMENT ATTACHMENT 2

Updated Draft Mitigation Monitoring and Reporting Program - May, 2008

Authority and Purpose

Pursuant to the California Public Resources Code, Section 21081.6 (Assembly Bill 3180), Marin County is required to implement a mitigation monitoring and reporting program for the Redwood Landfill Solid Waste Facilities Permit Revision Project. The County's monitoring program is established in the conditions of permit revision approval and as further set forth in the mitigation conditions and verification measures listed here.

The purpose of this mitigation monitoring and reporting program is to ensure compliance with and effectiveness of the mitigation measures identified in the certified EIR for the Redwood Landfill Solid Waste Facilities Permit Revision Project. PRC Section 21081.6 requires monitoring of mitigation measures for those impacts identified in the EIR to be significant.

County Monitoring Program features

The County's mitigation monitoring and report program for the Redwood Landfill Solid Waste Facilities Permit Revision Project consists of two major elements:

- A list of mitigation conditions and verifications required of the project sponsor at each stage of project approval and development.
- A checklist to document and verify mitigation condition compliance.

Updated Draft MMRP

The MMRP presented in the following pages includes changes to the version that appeared in Appendix A of the 2005 FEIR, which are indicated as follows:

<u>Additions to the text are underlined</u>

~~Deletions are struck through.~~

REDWOOD LANDFILL SOLID WASTE FACILITIES PERMIT REVISION
MITIGATION MONITORING AND REPORT PROGRAM

IMPACT AND SIGNIFICANCE AFTER MITIGATION	MITIGATION	IMPLEMENTED BY	WHEN IMPLEMENTED	MONITORED BY	VERIFIED BY AND DATE
Aesthetics					
3.1.6: The increase in waste receipts and compost throughput and the use of a waste tipper could result in increased litter on and near the project site, causing adverse aesthetic impacts in the site vicinity. (LTS)	**3.1.6a:** RLI will continue its current litter-control program, which includes the following elements (GeoSyntec, 1998): • compaction of the waste, • application of daily cover, • placement of fixed and portable litter fences around the active working face, • construction of a semi-permanent litter fence on the east and north sides of the landfill adjacent to San Antonio Creek, • daily use of a clean-up crews to collect litter from the site and surrounding area, and • use of signage to advise haulers that incoming loads must be properly covered and that tarps are to be removed only in designated areas.	Applicant	The project applicant shall implement this measure upon issuance of the revised SWFP.	Marin County EHS	Marin County EHS and CIWMB, both of whom conduct periodic inspections of the site.
	3.1.6b: The tipper is not operated in winds exceeding 50 mph (GeoSyntec, 1998).	Applicant	The project applicant shall implement this measure upon issuance of the revised SWFP.	Marin County EHS	Marin County EHS and CIWMB, both of whom conduct periodic inspections of the site.
	3.1.6c: RLI shall update <u>as necessary and implement</u> its current litter-control program ~~as necessary~~ to ensure compliance with 27 CCR §20830. The updated program will take into account the use of the waste tipper and the increase in incoming waste and composting receipts, and will indicate the means to prevent litter from escaping the Oxbow area proposed for composting. Measures may include, but are not limited to, the following: • use of additional portable litter fencing in the Oxbow area,	Applicant	The project applicant shall submit the updated littler control plan to the LEA prior to project approval. The project applicant shall implement the litter control program upon issuance of the revised SWFP.	Marin County EHS	CIWMB, prior to issuance of revised SWFP; periodic inspections to ensure implementation.

REDWOOD LANDFILL SOLID WASTE FACILITIES PERMIT REVISION MITIGATION MONITORING AND REPORT PROGRAM (Continued)

IMPACT AND SIGNIFICANCE AFTER MITIGATION	MITIGATION	IMPLEMENTED BY	WHEN IMPLEMENTED	MONITORED BY	VERIFIED BY AND DATE
3.1.6 (cont.)	• use of higher temporary fences at the working face, as needed to prevent litter from escaping when loads are emptied by the tipper, and • increasing the staff of the daily clean-up crew to adequately police the additional areas proposed for composting. RLI shall submit the updated litter control plan to the LEA for approval prior to project implementation.				
	3.1.6d: The waste tipper shall not be operated in wind conditions that would result in windblown litter, regardless of wind speed.	Applicant	The project applicant shall implement this measure upon issuance of the revised SWFP.	Marin County EHS	Marin County EHS, continuing periodic inspections.
	3.1.6e: Any changes to procedures or practices in the approved project must be reported to and approved (with conditions of approval, as appropriate) by the appropriate oversight agency.	Applicant	The project applicant shall implement this measure upon issuance of the revised SWFP.	Marin County EHS	Marin County EHS, continuing periodic inspections.
Air Quality					
3.2.1: Construction activities would generate substantial amounts of dust, which would result in potential health and nuisance impacts in the immediate project vicinity. (LTS)	**3.2.1a:** As described under existing facilities in the Joint Technical Document (JTD) (GeoSyntec, 1998), the applicant controls dust by frequent application of water spray on soil-covered work areas and the use of a dust palliative on the access road and main haul roads, if necessary, to supplement watering. The JTD indicates that the same practices would be continued under the project.	Applicant	The project applicant shall continue to implement this measure upon issuance of the revised SWFP.	Marin County EHS, BAAQMD	Marin County EHS and BAAQMD, continuing periodic inspections.
	3.2.1b: The applicant shall implement good construction practices to minimize fugitive dust. Such practices shall include general watering of exposed areas, the use of palliatives or other dust suppressants on any unpaved haul roads, and periodic cleaning of paved roads.	Applicant	The project applicant shall implement this measure upon issuance of the revised SWFP.	Marin County EHS, BAAQMD	Marin County EHS and BAAQMD, continuing periodic inspections.

REDWOOD LANDFILL SOLID WASTE FACILITIES PERMIT REVISION MITIGATION MONITORING AND REPORT PROGRAM (Continued)

IMPACT AND SIGNIFICANCE AFTER MITIGATION	MITIGATION	IMPLEMENTED BY	WHEN IMPLEMENTED	MONITORED BY	VERIFIED BY AND DATE
3.2.1 (cont.)	**3.2.1c:** The applicant shall implement a Construction Dust Abatement Program. Construction contractors and landfill staff involved in construction activities at the site shall implement a Construction Dust Abatement Program to reduce the contribution of project construction-related dust emissions to local respirable particulate matter concentrations. Some of these measures are similar to those identified under Measures 3.2.1a and 3.2.1b, but with additional specificity. This program shall include the following elements as needed to reduce fugitive dust to acceptable levels, using the BAAQMD Regulation 6 visible emissions standards as a guide: • Water all active construction areas at least twice daily. • Cover all trucks hauling soil, sand, and other loose materials, or require all trucks to maintain at least 2 feet of freeboard (i.e., the minimum required space between the load and the top of the trailer). • Pave, apply water three times daily, or apply nontoxic soil stabilizers on all unpaved access roads, parking areas, and construction staging areas. • Sweep daily with water sweepers all paved access roads, parking areas, and staging areas at construction sites. • Sweep streets daily with water sweepers, if visible soil material is carried onto adjacent public streets. • Hydroseed or apply nontoxic soil stabilizers to inactive construction areas (previously graded areas inactive for ten days or more). • Enclose, cover, water twice daily, or apply nontoxic soil binders to exposed stockpiles (dirt, sand, etc.). • Limit traffic speeds on unpaved roads to 15 miles per hour. • Install silt fences or other erosion-control measures to prevent silt runoff to public roadways.	Applicant	The project applicant shall submit a written description of Construction Dust Abatement Program to the Marin County EHS and BAAQMD prior to project approval. The project applicant shall implement the Program upon issuance of revised SWFP.	Marin County EHS, BAAQMD	Marin County EHS and BAAQMD, continuing periodic inspections.

REDWOOD LANDFILL SOLID WASTE FACILITIES PERMIT REVISION MITIGATION MONITORING AND REPORT PROGRAM (Continued)

IMPACT AND SIGNIFICANCE AFTER MITIGATION	MITIGATION	IMPLEMENTED BY	WHEN IMPLEMENTED	MONITORED BY	VERIFIED BY AND DATE
3.2.1 (cont.)	• Replant vegetation in disturbed areas as quickly as possible. Designate a person or persons to oversee the implementation of a comprehensive dust control program and to increase watering, as necessary.				
3.2.2: Equipment and truck operations associated with an increase in incoming materials at the landfill would generate additional criteria air pollutant emissions. (SU)	**3.2.2a:** The project applicant shall keep all off-road equipment well-tuned and regularly serviced to minimize exhaust emissions, and shall establish a regular and frequent check-up and service/maintenance program for all operating equipment at the landfill.	Applicant	The project applicant shall submit a written description of the equipment check-up and service/ maintenance program, including document keeping and reporting requirements, to Marin EHS and BAAQMD prior to project approval. The project applicant shall implement the program upon issuance of the revised SWFP	Marin County EHS, BAAQMD	Marin County EHS and BAAQMD, continuing periodic inspections.
	3.2.2b: The project applicant shall use ultra-low sulfur fuel (with low sulfur and low aromatic content) in combination with a fuel additive (such as Puri-NO_X) in all diesel-powered off-road equipment to minimize NO_X emissions to the extent that these materials are available to Bay Area transit agencies and may be purchased by the Redwood Landfill as well. Products such as this can reduce NO_X emissions by roughly 14 percent.	Applicant	The project applicant shall implement this measure upon issuance of the revised SWFP.	Marin County EHS, BAAQMD	Marin County EHS and BAAQMD, continuing periodic inspections.
	3.2.2c: As off-road equipment ages and requires replacement, the project applicant can be expected to purchase new equipment that incorporates technology that meets more stringent emission standards mandated by CARB. Alternatively, the project applicant may purchase electrically-powered equipment, or equipment fueled by an alternative, less-emitting fuel (e.g., liquefied natural	Applicant	The project applicant shall implement this measure upon issuance of the revised SWFP.	BAAQMD, Marin County EHS,	BAAQMD and Marin County EHS, continuing periodic inspections.

REDWOOD LANDFILL SOLID WASTE FACILITIES PERMIT REVISION MITIGATION MONITORING AND REPORT PROGRAM (Continued)

IMPACT AND SIGNIFICANCE AFTER MITIGATION	MITIGATION	IMPLEMENTED BY	WHEN IMPLEMENTED	MONITORED BY	VERIFIED BY AND DATE
3.2.2 (cont.)	gas [LNG] or compressed natural gas [CNG]). Use of alternative fuel engines can be expected to achieve a reduction in NO_X emissions of at least 37 percent. At the time of replacement, the applicant shall purchase new equipment that meets then-current emission and pollution control standards. Older equipment still in use at the site that does not meet new CARB standards shall be fitted with diesel particulate traps and fueled with a biodiesel blend to reduce particulates and other pollutants.				
	3.2.2d: As collection vehicles are replaced, the project applicant, including other Waste Management affiliates that regularly haul materials to Redwood Landfill, shall comply with CARB's Solid Waste Collection Vehicle Fleet Rule (contained in Title 13, California Code of Regulations, Sections 2020, 2021, 2021.1, and 2021.2) adopted in September 2003 to address diesel particulate matter. The project applicant shall give preference to add-on technologies or control measures (such as fleet conversions) that also reduce NO_x emissions, while meeting necessary BACT requirements. The types of control measures that may be implemented include such measures as converting their collection fleets to vehicles that operate on alternative, low-emission fuels (such as CNG, LNG, or biodiesel) use of particulate traps, or modification or replacement of diesel engines to reduce NO_X emissions, by such measures as incorporating exhaust gas recirculation (ERG) systems and/or stratified combustion chambers, and/or by using ultra-low sulfur fuel and fuel additives.	Applicant	The project applicant shall implement this measure upon issuance of the revised SWFP.	BAAQMD, Marin County EHS	BAAQMD and Marin County EHS, continuing periodic inspections.
	3.2.2e: The project applicant shall require all diesel trucks and equipment on-site to limit engine idling to three minutes or less.	Applicant	The project applicant shall implement this measure upon issuance of the revised SWFP.	BAAQMD, Marin County EHS	BAAQMD and Marin County EHS, continuing periodic inspections.

REDWOOD LANDFILL SOLID WASTE FACILITIES PERMIT REVISION MITIGATION MONITORING AND REPORT PROGRAM (Continued)

IMPACT AND SIGNIFICANCE AFTER MITIGATION	MITIGATION	IMPLEMENTED BY	WHEN IMPLEMENTED	MONITORED BY	VERIFIED BY AND DATE
3.2.4: Landfill operations, including vehicle and equipment travel on unpaved surfaces, would generate fugitive dust. (SU)	**3.2.4:** The project applicant shall develop and implement an Operational Dust Mitigation Plan/Program, in conjunction with the BAAQMD and the LEA that would achieve at a minimum a dust control efficiency of about 75 percent. Upon completion, the Plan shall be subject to BAAQMD review and approval. Components of the Plan should include: • A watering program consistent with current practices. On dry days, apply water to unpaved driving surfaces at least once every three hours, and to parking areas and infrequently used unpaved surfaces, the active landfill face, active stockpile areas, or other dust prone areas at least twice daily. Apply water to composting operations areas once or twice daily, as needed. On rainy days, apply water to these areas as necessary to reduce visible emissions. • Use of a chemical palliative or dust suppressant to reduce fugitive dust emissions from vehicle travel surfaces. Some chemical stabilizers can contain a considerable fraction of hydrocarbons, and should be selected judiciously. The choice of chemical palliative shall be made with the approval of the RWQCB, BAAQMD, and the LEA. • Posting signs at the site that limit traffic speeds on unpaved roads to 15 miles per hour. • Sweeping daily with water sweepers all paved access roads and parking areas. • Appoint a designated person to oversee implementation of the Operational Dust Mitigation Plan, and make them responsible for ensuring that the Plan is fully implemented.	Applicant	The project applicant shall submit a written description of the Operational Dust Mitigation Plan/Program, including document keeping and reporting requirements, to the Marin County EHS and BAAQMD prior to project approval. The project applicant shall implement the Plan/Program upon issuance of revised SWFP.	BAAQMD, RWQCB, and Marin County EHS,	BAAQMD, RWQCB, and Marin County EHS continuing periodic inspections.

REDWOOD LANDFILL SOLID WASTE FACILITIES PERMIT REVISION MITIGATION MONITORING AND REPORT PROGRAM (Continued)

IMPACT AND SIGNIFICANCE AFTER MITIGATION	MITIGATION	IMPLEMENTED BY	WHEN IMPLEMENTED	MONITORED BY	VERIFIED BY AND DATE
3.2.5: The project would increase the amount of landfill gas generated and could exceed the capacity of the landfill gas collection and treatment system. In addition, emissions of air pollutants from the landfill gas treatment system, as well as fugitive landfill gas emissions, would increase. (SU)	**3.2.5a:** The applicant has installed a landfill gas flare capable of accommodating a landfill gas flow rate of up to 4,250 cfm. The flare currently is permitted to operate at a maximum flow rate of 4,000 cfm. The flare also is used to destroy leachate vapors from the leachate vaporator.	Applicant	The project applicant shall implement this measure, consistent with Measures 3.2.5c and 3.2.5d, upon issuance of revised SWFP.	BAAQMD, Marin County EHS,	BAAQMD and Marin County EHS, continuing periodic inspections.
	3.2.5b: The applicant has installed a leachate vaporator that operates at a landfill gas flow rate of 167 cfm.	Applicant	The project applicant had installed a leachate vaporator prior to commencement of the environmental review for the proposed project and has since discontinued its use. In RLI's November 2004 application to the BAAQMD, RLI requested that it be taken out of the facility's air permits (Sullivan, 2006, in Response to Comments Amendment, p. 2-41).	BAAQMD, Marin County EHS,	BAAQMD and Marin County EHS, continuing periodic inspections.
	3.2.5c: The project applicant shall apply to the BAAQMD for authority to construct power generation engines to be fueled by landfill gas capable of producing 4 to 5 megawatts of power within two years of concurrence on its revised SWFP by the CIWMB. This will increase the overall capacity available to treat landfill gas, and will also result in the beneficial use of some portion of the landfill gas generated. Operation of the landfill-gas-powered generators will make the project consistent with Policy 4.2 of the Marin Countywide Plan Community Development	Applicant	The project Applicant shall apply within the time specified in this measure for Authority to Construct, which authorizes operation for 90 days; after this a Permit to Operate is required. The	BAAQMD	BAAQMD

REDWOOD LANDFILL SOLID WASTE FACILITIES PERMIT REVISION MITIGATION MONITORING AND REPORT PROGRAM (Continued)

IMPACT AND SIGNIFICANCE AFTER MITIGATION	MITIGATION	IMPLEMENTED BY	WHEN IMPLEMENTED	MONITORED BY	VERIFIED BY AND DATE
3.2.5 (cont.)	element (refer to Applicable Plans and Policies in Section 3.9, Public Services, Utilities, and Energy), which calls for exploration and implementation, where possible, of opportunities for cost-effective energy savings that are compatible with other countywide and community goals.		applicant shall pursue a Permit to Operate as specified in Mitigation Measure 3.2.5e.		
	3.2.5d: The applicant shall apply to the BAAQMD to revise limits in the current Permit to Operate the flare, as needed to accommodate increased LFG generation. The flare/vaporator system will be operated/equipped as necessary to ensure BAAQMD emission limits specified in the PTO are maintained. The project applicant shall provide background test data and/or other supporting data as necessary to document to the BAAQMD and LEA that the system would accommodate worst case peak gas emissions.	Applicant	The applicant shall implement this measure prior to project approval. The project applicant shall submit specified test data and/or supporting data to the BAAQMD and LEA prior to project approval and in annual reporting documents thereafter.	BAAQMD, Marin County EHS	BAAQMD according to terms of permit
	3.2.5e: The applicant shall apply for a Permit to Operate the power generation engines within the time frame specified in the Authority to Construct and shall operate the power generation engines in compliance with all BAAQMD regulations and conditions specified in the Permit to Operate. The applicant shall continue to maintain records of all compliance demonstration test results as specified in the Authority to Construct.	Applicant	The project applicant shall implement this measure within 90 days of commencement of operation of engines under an Authority to Construct.	BAAQMD	BAAQMD according to terms of permit
	3.2.5f: Prior to ~~Within two years of~~ project approval, the applicant will develop a Greenhouse Gas Reduction plan that demonstrates how the landfill will achieve by 2020 a reduction in annual GHG emissions such that emissions are no greater than 15 percent below 1990 levels. This will include but is not limited to development of additional landfill gas-to-energy production capacity; use of alternative fuels in on-site equipment and in truck fleets, ~~increased diversion of organic material from landfill disposal and use as landfill cover material,~~ increased recycling, and development of other on-site renewable	Applicant	The project applicant shall submit the GHG Reduction plan prior to project approval and shall implement the plan, including demonstrating compliance with interim targets, as specified in the text of the measure.	BAAQMD, Marin County CDA, Marin County EHS	Marin County CDA (timing of milestones)

REDWOOD LANDFILL SOLID WASTE FACILITIES PERMIT REVISION MITIGATION MONITORING AND REPORT PROGRAM (Continued)

IMPACT AND SIGNIFICANCE AFTER MITIGATION	MITIGATION	IMPLEMENTED BY	WHEN IMPLEMENTED	MONITORED BY	VERIFIED BY AND DATE
3.2.5 (cont.)	energy generation capacity. For emission reductions that cannot feasibly be achieved through on-site measures, the plan may specify purchase of off-site ~~, and~~ carbon credits ~~offsets~~ that are verified and listed with the California Climate Action Registry. The plan will include specific measures and a timeline for reducing the landfilling and use as landfill cover material of putrescible organic material. This will include, but is not limited to, phasing out the use of raw greenwaste and sewage sludge as alternative daily cover material, reducing the landfilling of sewage sludge, food waste, and other materials with a potential for high methane generation, and cooperative programs with waste collectors, individual municipalities, and joint powers authorities to increase source separation of organic materials for composting. The plan will include cost estimates for plan implementation ~~GHG reduction measures~~ and will identify funding sources, including but not limited to tip fee increases. The plan shall include an implementation schedule that demonstrates compliance with the following interim and final targets: **By 2010:** Greenhouse gas emissions reduced by 15% below annual baseline; **By 2015:** Greenhouse gas emissions reduced by 25% below annual baseline; **By 2020:** Greenhouse gas emissions reduced to 15% below 1990 levels; **Beyond 2020:** Greenhouse gas emissions not to exceed 15% below 1990 levels. ~~substantial GHG emission reductions prior to the 2020 deadline, including implementation of "early action" measures that may be implemented within two years of plan approval.~~ The plan will include an updated inventory				

REDWOOD LANDFILL SOLID WASTE FACILITIES PERMIT REVISION MITIGATION MONITORING AND REPORT PROGRAM (Continued)

IMPACT AND SIGNIFICANCE AFTER MITIGATION	MITIGATION	IMPLEMENTED BY	WHEN IMPLEMENTED	MONITORED BY	VERIFIED BY AND DATE
3.2.5 (cont.)	of ~~projected~~ lifecycle GHG emissions including and an updated estimate of GHG emissions in 1990 and each year thereafter. The updated inventory shall constitute the annual baseline for the purpose of determining the above-stated targets. The plan will be updated and submitted for review and approval at least every 5 years. The plan will be subject to review and approval by Marin County Community Development Agency and the Bay Area Air Quality Management District. Because the release of GHG emissions has been identified as a potentially significant impact associated with the expansion of landfill capacity, the increase in the permitted capacity, as part of the project, will be contingent upon meeting the above GHG reduction requirements. The total additional capacity granted under the Mitigated Alternative is 5.9 million cubic yards (without final cover), and will be granted contingent upon other project conditions.				
	3.2.5g: Following closure of the landfill, the applicant shall continue to operate, maintain, and monitor the landfill gas collection and treatment system as long as the landfill continues to produce landfill gas, or until it is determined by the BAAQMD that emissions no longer constitute a considerable contribution to greenhouse gas emissions, whichever comes first. Because the landfill will continue to produce substantial quantities of landfill gas well beyond the 30-year post-closure maintenance period specified in the JTD, the applicant shall prepare a revised Preliminary Post-Closure Maintenance Plan that plans for and provides financial assurances for operation, maintenance, and monitoring of the landfill gas collection and treatment system for an indefinite period. Financial assurances shall meet the requirements of California Code of Regulations Title 27, Chapter 6, and shall be sufficient for the entire cost of closure and post-closure maintenance.	Applicant	The project applicant shall submit the revised Preliminary Post-Closure Maintenance Plan prior to project approval. The project applicant shall implement this measure following closure of the landfill and shall continue to implement it as specified in the text of the mitigation measure.	Marin County EHS, CIWMB, BAAQMD	Marin County EHS, BAAQMD, periodic inspections during post-closure period

REDWOOD LANDFILL SOLID WASTE FACILITIES PERMIT REVISION MITIGATION MONITORING AND REPORT PROGRAM (Continued)

IMPACT AND SIGNIFICANCE AFTER MITIGATION	MITIGATION	IMPLEMENTED BY	WHEN IMPLEMENTED	MONITORED BY	VERIFIED BY AND DATE
3.2.6: The project would increase the amount of ROG emissions from composting/ co-composting activities. (LTS)	**3.2.6a:** The project applicant shall maintain records of all materials composted (in terms of volume or weight by material type) and shall comply with all applicable rules, regulations and permit conditions.	Applicant	The project applicant shall implement this measure upon issuance of the revised SWFP.	Marin County EHS	Marin County EHS, CIWMB; periodic inspections
	3.2.6b: The applicant shall prepare an Emissions Monitoring Plan that includes source testing of windrows used for composting and co-composting to obtain site-specific ROG emissions data. The Monitoring Plan shall require analysis of the effect of various feedstock materials on composting emissions, and a comparison of emissions during wet and dry season periods. The Monitoring Plan shall be subject to BAAQMD review and approval.	Applicant	The project applicant shall submit the Emissions Monitoring Plan to BAAQMD within one year of issuance of revised SWFP.	Marin County EHS and BAAQMD	Marin County EHS and BAAQMD will review and approve Plan within 3 months of submission by applicant
	3.2.6c: The applicant shall also conduct a feasibility study to determine the technologic and economic feasibility of using a composting method that allows for collection and treatment of gaseous emissions from active composting piles, such as an aerated static pile system with biofilters. The target ROG emissions reduction rate for purposes of the study shall be a minimum of 25 percent, such that the increase in emissions would be below the BAAQMD 80 pounds per day significance threshold. The results of the feasibility study shall be provided to the BAAQMD such that BAAQMD staff may consider incorporation of additional requirements to reduce ROG emissions into air permits for the site. The results of the study shall also be submitted to the LEA. If controls are determined to be infeasible or not economical, then the project applicant shall reduce the amount of compostable materials that are accepted at the site by 25 percent on a daily basis.	Applicant	The project applicant shall submit system design prior to project approval.	Marin County EHS and BAAQMD	Marin County EHS, CIWMB, and BAAQMD, design approval prior to issuance of revised SWFP; periodic inspection after implementation

REDWOOD LANDFILL SOLID WASTE FACILITIES PERMIT REVISION
MITIGATION MONITORING AND REPORT PROGRAM (Continued)

IMPACT AND SIGNIFICANCE AFTER MITIGATION	MITIGATION	IMPLEMENTED BY	WHEN IMPLEMENTED	MONITORED BY	VERIFIED BY AND DATE
3.2.6 (cont.)	**3.2.6d:** The applicant shall conduct monitoring in accordance with the approved Monitoring Plan and shall prepare a report summarizing the findings of the monitoring. Copies of the written report shall be provided to the BAAQMD and LEA for incorporation into permits for the site.	Applicant	The applicant shall submit the specified report to the BAAQMD and Marin County EHS within six months of initial approval of the Plan and annually thereafter.	Marin County EHS and BAAQMD	Marin County EHS and BAAQMD, periodically and continuing
3.2.8: Emissions of toxic air contaminants could pose a risk to human health. (LTS)	**3.2.8a:** The landfill gas collection and flare system will substantially reduce the rate of emission of TACs from the landfill.	Applicant	The project applicant has already implemented this measure and shall continue to do so upon issuance of the revised SWFP.	BAAQMD, Marin County EHS	BAAQMD and Marin County EHS periodically and continuing
	3.2.8b: Best management practices for the composting and co-composting operation, including scheduled pile turning and managing piles to avoid excessively high temperatures, will reduce the emissions of TACs from composting and co-composting operations.	Applicant	The project applicant shall implement this measure upon issuance of the revised SWFP	Marin County EHS and BAAQMD	Marin County EHS and BAAQMD, periodically and continuing
	3.2.8c: New federal regulations for offroad diesel equipment were promulgated in May 2004. These regulations require that, starting in 2010, new equipment will have to reduce emissions of NOx and diesel PM by about 90%. However, any equipment already in use at the time of the new regulation would be grandfathered and would not have to meet the new emissions limits. Since this equipment can operate for many years before needing replacement, future emissions would be at a higher rate. If Mitigation Measures 3.2.2a-d (as revised in this FEIR) are adopted on the existing equipment, diesel PM emissions from off-road equipment can be reduced to levels that are less than significant. Some of the measures specified to reduce NO_X emissions, such as the use of natural gas as an alternative fuel, would also reduce diesel PM emissions. Use of	See referenced mitigation measure.			

REDWOOD LANDFILL SOLID WASTE FACILITIES PERMIT REVISION MITIGATION MONITORING AND REPORT PROGRAM (Continued)

IMPACT AND SIGNIFICANCE AFTER MITIGATION	MITIGATION	IMPLEMENTED BY	WHEN IMPLEMENTED	MONITORED BY	VERIFIED BY AND DATE
3.2.8 (cont.)	alternative fuels can reduce fine PM emissions by as much as 90 percent**,** and electrically-powered equipment does not emit any diesel PM. Alternatively, all off-road diesel equipment at the site could be retrofitted with diesel particulate traps that are capable of removing over 85 percent of the diesel PM emissions, and since diesel equipment with diesel PM traps must use ultra low sulfur fuel, this would also reduce NOx emissions. Therefore, the incremental health risk associated with offroad diesel equipment would be reduced from 18 in a million to 2.7 (with diesel PM traps) or less (with electric or natural gas fueled engines) new cancer cases for every million people exposed.				
	3.2.8d: Although diesel PM emissions from new on-road trucks after 2007 will be reduced because the trucks will have to comply with the Federal regulations, trucks that were purchased before 2007 would not be subject to the new regulations. Diesel PM emissions from the older truck fleet shall be reduced by retrofitting the trucks with particulate traps.	Applicant	The applicant shall implement this measure upon issuance of the SWFP.	BAAQMD	Continuing periodic inspections.
3.2.9: Project operations could result in nuisance odor emissions. (LTS)	**3.2.9a:** Continuation of current odor management practices. These include: covering landfilled waste at the end of each day with either soil or mixed ADC; applying potassium permanganate to air drying sludge and operation of a vapor phase odor counteractant system around the landfill's southern boundary; and, maintaining windrows in a manner that optimizes the composting process.	Applicant	The applicant shall continue to implement this measure upon issuance of the revised SWFP.	Marin County EHS and BAAQMD	Marin County EHS and BAAQMD, periodically and continuing
	3.2.9b: The project applicant shall formulate an Odor Impact Minimization Plan in accordance with the recently revised State composting regulations (Title 14 CCR § 17863.4.) This plan will be submitted to the LEA as part of the application for a solid waste facilities permit for the expanded composting facility and implemented upon issuance of the revised SWFP. In accordance with the above-cited regulations, the plan shall contain, at a minimum:	Applicant, Marin County EHS, BAAQMD	The applicant shall submit the Plan prior to project approval. The project applicant shall implement provisions of the Plan as specified upon issuance of the revised SWFP.	Marin County EHS, BAAQMD	Marin County EHS and BAAQMD, continuing periodic inspections.

REDWOOD LANDFILL SOLID WASTE FACILITIES PERMIT REVISION MITIGATION MONITORING AND REPORT PROGRAM (Continued)

IMPACT AND SIGNIFICANCE AFTER MITIGATION	MITIGATION	IMPLEMENTED BY	WHEN IMPLEMENTED	MONITORED BY	VERIFIED BY AND DATE
3.2.9 (cont.)	• an odor monitoring protocol which describes the proximity of possible odor receptors and a method for assessing odor impacts at the locations of the possible odor receptors; and, • a description of meteorological conditions effecting migration of odors and/or transport of odor-causing material off-site. Seasonal variations that effect wind velocity and direction shall also be described; and, a complaint response protocol that includes the immediate notification of BAAQMD Compliance & Enforcement Division and County LEA staff upon receipt of any odor complaints and the provision of the BAAQMD odor complaint hotline number (1-800-334-ODOR [6367]) to complainants upon receipt of their call; and, • a description of design considerations and/or projected ranges of optimal operation to be employed in minimizing odor, including method and degree of aeration, moisture content of materials, feedstock characteristics, airborne emission production, process water distribution, pad and site drainage and permeability, equipment reliability, personnel training, weather event impacts, utility service interruptions, and site specific concerns; and, • a description of operating procedures for minimizing odor, including aeration, moisture management, feedstock quality, drainage controls, pad maintenance, wastewater pond controls, storage practices (e.g., storage time and pile geometry), contingency plans (i.e., equipment, water, power, and personnel), biofiltration, and tarping.				
3.2.10: The proposal to air-dry stockpiled sewage sludge could result in increased emissions of volatile organic compounds and odors. (LTS)	**3.2.10a:** To control odors during drying, the applicant will apply potassium permanganate solution to the surface of the drying sludge and apply an odor counteractant liquid as a vapor phase spray in the drying area.	Applicant	The applicant shall implement this measure upon issuance of the revised SWFP.	BAAQMD and Marin County EHS	BAAQMD and Marin County EHS periodically and continuing

REDWOOD LANDFILL SOLID WASTE FACILITIES PERMIT REVISION MITIGATION MONITORING AND REPORT PROGRAM (Continued)

IMPACT AND SIGNIFICANCE AFTER MITIGATION	MITIGATION	IMPLEMENTED BY	WHEN IMPLEMENTED	MONITORED BY	VERIFIED BY AND DATE
3.2.10 (cont.)	**3.2.10b:** The applicant shall limit the amount of sewage sludge air dried each day to less than 1,800 wet tons (360 dry tons) per day. At an emission rate of .29 pounds per dry ton per day, this would result in emissions lower than 104 pounds of VOCs per day, which represents an increase of less than 80 pounds per day above the currently permitted limit of 24 pounds per day specified in the 1994 FEIR.	Applicant	The applicant shall implement this measure upon issuance of a revised SWFP for the referenced quantity.	BAAQMD, Marin County EHS	BAAQMD and Marin County EHS, periodically and continuing
	3.2.10c: Alternatively, the applicant could purchase emissions credits from the BAAQMD, resulting in an off-set of VOC (ROG) emissions of any increment above 104 pounds per day. This would enable the applicant to process more than 1,800 wet tons (360 dry tons) per day of sewage sludge.	Applicant	The applicant shall implement this measure prior to commencing air drying of sludge in amount exceeding 1,800 wet tons per day.	BAAQMD, Marin County EHS	BAAQMD, according to terms of purchase of emissions credits
3.2.11: The combined emissions from project operations would exceed BAAQMD significance criteria for ROG, NO_X and PM-10. (SU)	**3.2.11:** Implementation of Mitigation Measures 3.2.2 (a-d), 3.2.4, 3.2.5(d-e), 3.2.6(a-d), and 3.2.10(b or c) would help to mitigate the combined project operational emissions.	See referenced mitigation measure.			
3.2.13: Transport, handling, and disposal of the proposed increased volume of designated wastes could result in increased emissions of various air pollutants. (Significant)	**3.2.13:** The applicant has in place special handling requirements for generators of ash waste and procedures in place that ensure that acceptance and disposal of ash waste does not result in migration of airborne particles.	Applicant	The project applicant shall continue to implement this measure upon issuance of the revised SWFP or WDRs.	Marin County EHS and RWQCB	Marin County EHS and RWQCB, periodic and ongoing inspections
3.2.14: Acceptance of a greater quantity of petroleum contaminated soil (meeting Regional Water Quality Control Board acceptance criteria) and use of this material as alternative daily cover could result in increased emissions of volatile organic compounds. (LTS)	**3.2.14:** The applicant shall limit the acceptance of PC soils meeting RWQCB acceptance criteria for use as ADC only to those situations in which the PC soils will be exposed to the atmosphere for less than 24 hours. The applicant will ensure that, within 24 hours of receiving PC soils, the PC soils will either be covered with tarps, with waste material, or with other cover material.	Applicant	The applicant shall implement this measure upon issuance of the revised SWFP.	Marin County EHS and BAAQMD	Marin County EHS and BAAQMD, periodically and continuing

REDWOOD LANDFILL SOLID WASTE FACILITIES PERMIT REVISION MITIGATION MONITORING AND REPORT PROGRAM (Continued)

IMPACT AND SIGNIFICANCE AFTER MITIGATION	MITIGATION	IMPLEMENTED BY	WHEN IMPLEMENTED	MONITORED BY	VERIFIED BY AND DATE
Biological Resources					
3.3.2: Project activities may disturb habitat for special status plant species. (LTS)	**3.3.2*:*** No project actions shall be permitted which result in removal of vegetation above the toe of the slope on the marsh side of landfill levees unless preceded by a survey to establish that no sensitive plant species are present.	Applicant	The project applicant shall implement this measure prior to commencement of work on levees	Marin County EHS	Marin County EHS, CDFG, USFWS, as needed
3.3.3: Project activities may disturb jurisdictional wetlands. (LTS)	**3.3.3*:*** When working near brackish marsh areas, the edge of the marsh shall be clearly marked with orange mesh fencing or equivalent to indicate limits of disturbance.	Applicant	The project applicant shall implement this measure prior to commencement of work near brackish marsh areas	Marin County EHS	Marin County EHS, CDFG, USFWS, as needed
3.3.4: Project activities may have a deleterious effect on special status bird and mammal species. (LTS)	**3.3.4a:** Levee reconstruction work during the California clapper rail nesting season (February 1 – August 31) shall be avoided, unless surveys by a qualified biologist with a current federal scientific take permit for California clapper rail indicate that California clapper rails are not nesting within ~~700~~ 750 feet of the work area, or another distance determined in informal consultation with the U.S. Fish and Wildlife Service. The surveys ~~should~~ shall be conducted consistent with the current U.S. Fish and Wildlife Service survey protocol for California clapper rail. Furthermore, the surveys ~~should~~ shall be conducted to determine the pair status of any observed individuals, local habitat use, and location of nests (if any) to within at least 30 feet If nesting California clapper rails are found or ~~highly~~ suspected, one of the following measures ~~should~~ shall be implemented: (a) No construction activities ~~should~~ shall be conducted within ~~700~~ 750 feet of a known or suspected California clapper rail nest or within another distance determined in informal consultation with the U.S. Fish and Wildlife Service; or	Applicant	The project applicant shall implement this measure prior to commencement of work on levee reconstruction	Marin County EHS	Marin County EHS, CDFG, USFWS, as needed

REDWOOD LANDFILL SOLID WASTE FACILITIES PERMIT REVISION MITIGATION MONITORING AND REPORT PROGRAM (Continued)

IMPACT AND SIGNIFICANCE AFTER MITIGATION	MITIGATION	IMPLEMENTED BY	WHEN IMPLEMENTED	MONITORED BY	VERIFIED BY AND DATE
3.3.4 (cont.)	(b) Construction activities that must occur within ~~700~~ 750 feet (or another distance determined in informal consultation with the U.S. Fish and Wildlife Service) of a known or suspected California clapper rail nest ~~should~~ shall ~~not~~ be conducted only ~~until~~ between September 1 and January 31.				
	3.3.4b: Levee reconstruction work throughout the year (regardless of time) should be conducted consistent with the following provisions to address potential impacts to California clapper rail and salt marsh harvest mouse: (a) No construction activities should be conducted any earlier than 1.5 hours after sunrise and any later than 1.5 hours prior to sunset (to address the crepuscular activity peaks of this taxon); (b) No construction activities should be conducted 1.5 hours prior to or 1.5 hours after high tides that are of sufficient elevation to flood the adjacent middle intertidal marsh (when clapper rails and salt marsh harvest mice may need to seek refuge in high intertidal marsh or upland from rising tidal waters); and (c) Upon completion of the construction activities all disturbed soils in marsh habitat shall be winter stabilized to prevent erosion and allow for passive restoration of brackish marsh vegetation.	Applicant	The project applicant shall implement this measure prior to commencement of work on levee reconstruction	Marin County EHS	Marin County EHS, CDFG, USFWS, as needed
3.3.5: High noise levels from composting operations in the Oxbow area and in Field 1, and from landfill activities in Areas A and B may disturb California clapper rail nesting. (LTS)	**3.3.5a:** Bird deterrent practices and compost machinery, including tubgrinders, trammel screens, and windrow turners, and other composting equipment capable of generating high noise levels shall be operated to assure that noise levels do not exceed 76 dBA at the marsh boundary east of the levee during the California clapper rail nesting season (February 1 – August 31). Furthermore, the existing screening between the composting area and the marsh shall be maintained in place to minimize line-of-sight views of composting activities from the adjacent low intertidal marsh. See also Mitigation Measure 3.7.3.	Applicant	The project applicant shall submit detailed facility design, including location of machinery, prior to issuance of the revised SWFP.	Marin County EHS	Marin County EHS, CDFG, USFWS, periodic inspections

REDWOOD LANDFILL SOLID WASTE FACILITIES PERMIT REVISION MITIGATION MONITORING AND REPORT PROGRAM (Continued)

IMPACT AND SIGNIFICANCE AFTER MITIGATION	MITIGATION	IMPLEMENTED BY	WHEN IMPLEMENTED	MONITORED BY	VERIFIED BY AND DATE
3.3.5 (cont.)	**3.3.5b:** If landfill activities, including but not limited to bird deterrent practices, are to take place in Areas A or B during the California clapper rail nesting season (February 1 – August 31), they must be preceded by either (1) a biological survey to determine presence or absence of California clapper rail nests in the marsh area adjacent to the landfill (consistent with Mitigation Measure 3.3.4) or (2) a noise study to determine noise levels from landfill operations at the marsh boundary. Landfill activities may proceed in these areas during the nesting season only if it is determined that nests are not present, or that sound levels at the marsh boundary are below 76 dBA. Furthermore, if landfill activities are to take place in these areas during the nesting season, and surveys do not support a finding of absence of California clapper rail in the intertidal marsh adjacent to the landfill, visual screening shall be implemented at the top-of-slope of the active fill area (i.e., at the edge of the fill plateau) to minimize line-of-sight views from the adjacent intertidal marsh. It should be noted that this fence will need to be continually moved to the new edge of the fill plateau as the active fill area increases in height.	Applicant	The project applicant shall implement this measure prior to commencement of activities in Areas A or B during specified season.	Marin County EHS	Marin County EHS, CDFG, USFWS, as needed
3.3.6: Project activities in the vicinity of the 18-acre storm water impoundment could affect California red-legged frogs or western pond turtle. (LTS)	**3.3.6:** It is understood that the project involves changes in landfill capacity, design, operations, environmental controls, and infrastructure, and that these changes constitute a system of continuous operational actions as opposed to a discrete project timeframe. To avoid the possibility of "taking" (harming or harassing) red-legged frogs or pond turtles, surveys for their presence will be performed following approved protocols for season and intensity of surveys. For red-legged frogs these are four discrete surveys within a one-week period between May and November; pond turtle surveys could be done concurrently. If no frogs or pond turtles were found, the landfill would be considered operating adjacent to unoccupied habitat and no additional mitigation would be necessary. If frogs or pond turtles are found, the provisions described below will be followed. As an alternative to conducting the above surveys, the following measures will be followed without the surveys.	Applicant	The applicant shall complete specified surveys during the specified timeframe, any time before or after issuance of the revised SWFP. The project applicant shall implement the specified alternatives to the specified surveys as follows:	Marin County EHS, USFWS	Marin County EHS, CDFG, USFWS, as needed

REDWOOD LANDFILL SOLID WASTE FACILITIES PERMIT REVISION
MITIGATION MONITORING AND REPORT PROGRAM (Continued)

IMPACT AND SIGNIFICANCE AFTER MITIGATION	MITIGATION	IMPLEMENTED BY	WHEN IMPLEMENTED	MONITORED BY	VERIFIED BY AND DATE
3.3.6 (cont.)	• A 50 ft construction buffer zone will be established between work sites and the storm water pond. The storm water impoundment will be separated from the work areas with "frog-proof" staked fabric silt fencing at the border of the 50 ft buffer zone. The fencing will essentially extend along all areas bordering this impoundment from other landfill areas. The purpose of the fence is to limit site access by construction equipment and limit accidental wildlife movement onto the work sites. The fence shall be buried to a depth of at least 4 inches and be a minimum of 3 feet tall.	Applicant	The project applicant shall implement this measure within 30 days of confirmation of presence of red-legged frogs or pond turtles.	Marin County EHS and USFWS	Marin County EHS, CDFG, USFWS, as needed
	• An employee education program shall be conducted to explain red-legged frog concerns to landfill employees and contractors. The program shall consist of a brief presentation by persons knowledgeable in species biology and legislative protection and shall include the following: a description of the species and its habitat needs; the occurrence of the species in the project area; status of the species and its protection under the Federal Endangered Species Act, including fines and penalties; and measures being taken to reduce impacts to the species during active landfill or construction operations near sensitive areas.	Applicant	The project applicant shall implement this measure within 30 days of confirmation of presence of red-legged frogs or pond turtles, and annually thereafter.	Marin County EHS and USFWS	Marin County EHS, CDFG, USFWS, annually
	• If a California red-legged frog is identified in the project operational zone, all work in the immediate area shall immediately cease and the USFWS shall be contacted immediately.	Applicant	The project applicant shall implement this measure Immediately upon identification of red-legged frogs or pond turtles.	Marin County EHS and USFWS	Marin County EHS, CDFG, USFWS, as needed
3.3.7: Removal or remodeling of structures could result in the loss of individuals of special status bat species. (LTS)	**3.3.7:** Prior to removal of the buildings, they will be inspected for the presence of bats during the spring or summer of the year preceding construction by a qualified wildlife biologist. Should any bats be found, a qualified wildlife biologist holding the appropriate permits will remove and relocate the bats.	Applicant	The project applicant shall implement this measure during the spring or summer of the year preceding demolition, removal, or remodeling.	Marin County EHS, CDFG, USFWS	Marin County EHS, CDFG, USFWS, prior to removal or remodeling of buildings

REDWOOD LANDFILL SOLID WASTE FACILITIES PERMIT REVISION MITIGATION MONITORING AND REPORT PROGRAM (Continued)

IMPACT AND SIGNIFICANCE AFTER MITIGATION	MITIGATION	IMPLEMENTED BY	WHEN IMPLEMENTED	MONITORED BY	VERIFIED BY AND DATE
Geology, Soils, and Seismicity					
3.4.1: A seismic event on one of the active or potentially active Bay Area faults could generate seismic ground motion capable of causing failure of landfill slopes, displacement of perimeter levee slopes, damage to the LCRS, and/or damage to the proposed Area G liner. (LTS)	**3.4.1a:** A detailed Post Earthquake Inspection and Corrective Action Plan was prepared by RLI and approved by RWQCB in October 1995 (RLI, 1995a). The plan focuses on damage caused to groundwater monitoring wells, perimeter levees, and the LCRS following a major earthquake event. This plan includes, but is not limited to, the following: • visual inspection for damage, soil settlement, slope failure, tension cracks, ponding of water, and leachate seeps; • evaluation of water level fluctuations and slope inclinometer measurements of soils displacement; and	Applicant	The project applicant has already prepared the specified Post Earthquake Inspection and Corrective Action Plan. The project applicant shall implement the actions specified in this measure and the plan following all major earthquake events.	Marin County EHS	Marin County EHS, as needed
	• replacement of damaged wells and repair or reconstruction of the LCRS and perimeter levees. If groundwater monitoring performed as part of the Post Earthquake Inspection and Corrective Action Plan detects leachate outside the perimeter levee, the facility's collection and containment plan shall be implemented (refer to Mitigation Measure 3.4.7d, below).	See referenced mitigation measure.			
	3.4.1b: Costs to remediate degradation of groundwater or surface water due to earthquake-related landfill and perimeter levee slope displacement, and/or breaching of the leachate collection and removal system will be financially assured by the applicant's Pollution Legal Liability Insurance or an applicant-sponsored trust fund for closure/post-closure activities.	Applicant	The project applicant shall submit current documentation demonstrating acceptable funding levels for Financial Assurance Mechanism and current documentation of compliance with operating liability requirements prior to project approval.	Marin County EHS	Marin County EHS and CIWMB, periodically

REDWOOD LANDFILL SOLID WASTE FACILITIES PERMIT REVISION MITIGATION MONITORING AND REPORT PROGRAM (Continued)

IMPACT AND SIGNIFICANCE AFTER MITIGATION	MITIGATION	IMPLEMENTED BY	WHEN IMPLEMENTED	MONITORED BY	VERIFIED BY AND DATE
3.4.1 (cont.)	**3.4.1c:** The applicant shall update the existing Post Earthquake Inspection and Corrective Action Plan to reflect current understanding of ground motion and seismicity in the Bay Area, to address changes to the landfill site resulting from the proposed project, and to reflect geotechnical analyses conducted for the proposed project. The understanding of earthquake probabilities, predicted ground motion, the attenuation of seismic waves, and other aspects of seismology has advanced since the facility's current plan was written in 1995, and the plan shall be revised to reflect this new understanding. Consistent with the current plan, the revised plan shall require immediate inspection and repair of earthquake damage to the landfill slopes, perimeter levees, groundwater wells, and the LCRS. The measures to repair earthquake damage as developed in the revised Post Earthquake Inspection and Corrective Action Plan shall be submitted to the RWQCB for approval and become part of the project. The updated plan also will ~~discuss~~ specify contingency measures in the event that Redwood Landfill is unusable or inaccessible as a result of a major earthquake in the vicinity.	Applicant	The project applicant shall update and submit the specified Plan prior to project approval.	Marin County EHS and RWQCB	Marin County EHS, CIWMB, and RWQCB, upon submission of updated Plan
	3.4.1d: Prior to issuance of a Solid Waste Facility Permit for the project as proposed, the applicant shall perform additional seismic slope stability analyses to determine if the design of the landfill is adequate to withstand the Maximum Probable Earthquake during interim (short-term) conditions, in accordance with California Code of Regulations Title 27. The selection of the Maximum Probable Earthquake and the analyses themselves shall be subject to peer review by a geotechnical engineer. If the results of the analyses indicate an insufficient factor of safety or an excessive degree of seismically-induced deformation, the applicant shall prepare and submit a revised design for the landfill and demonstrate that the design meets the seismic stability requirements of Title 27. The revised design shall be subject to peer review by a geotechnical engineer.	Applicant	The project applicant shall implement this measure prior to issuance of a SWFP for the project as proposed.	Marin County EHS and RWQCB	Marin County EHS, CIWMB, and RWQCB, upon submission of the analyses

REDWOOD LANDFILL SOLID WASTE FACILITIES PERMIT REVISION MITIGATION MONITORING AND REPORT PROGRAM (Continued)

IMPACT AND SIGNIFICANCE AFTER MITIGATION	MITIGATION	IMPLEMENTED BY	WHEN IMPLEMENTED	MONITORED BY	VERIFIED BY AND DATE
3.4.2: Static forces acting on native materials underlying the landfill or on the refuse and cover materials could cause displacement of landfill slopes and the perimeter levee, damage to the LCRS, or differential settlement. (LTS)	**3.4.2a:** The applicant has developed and will utilize criteria for monitoring the lateral and vertical deformation of Bay Mud during fill placement to provide advance warning of potential instability. If the geotechnical monitoring program indicates an increasing rate of deformation in the monitored slopes, filling activity will stop at impacted areas. The applicant also has developed and will utilize criterion for monitoring pore pressures following fill placement to confirm that sufficient consolidation is achieved prior to placement of the next fill lift (GeoSyntec, 1997b). GeoSyntec recommends staged placement of refuse due to the low strength of the underlying Bay Mud. Based upon results of analyses, GeoSyntec developed an observational approach to monitor the stability of the waste fill at the site (GeoSyntec, 1997b). Geotechnical monitoring consists of installing, monitoring, and collecting data from inclinometers and piezometers. Currently there are 10 inclinometers (numbered I-6 through I-15) and 14 piezometers (numbered P-7 through P-10, P-13 through P-17, P-20, P-21, P-23, and P-24) at the site. Based on the results of collected field data, modification to the fill-sequencing plan may be needed. The modification may consist of limiting refuse placement in certain areas to restrict slope deformations, or taking advantage of stronger foundation conditions by increasing fill in these areas. However, such modifications shall not in any case alter the overall approved landfill capacity or final grades. GeoSyntec provides quantitative criteria to evaluate when the results of the inclinometers and piezometers indicate a slope failure may occur and filling should stop. These criteria, shown in Table 3.4-4, are based on the ratio of vertical and lateral deformations as provided by inclinometer readings and the rate of excess pore pressure generation for refuse placed as provided by piezometers.	Applicant	The project applicant shall implement this measure upon issuance of the revised SWFP.	Marin County EHS and RWQCB	Marin County EHS, CIWMB, and RWQCB, periodically

REDWOOD LANDFILL SOLID WASTE FACILITIES PERMIT REVISION MITIGATION MONITORING AND REPORT PROGRAM (Continued)

IMPACT AND SIGNIFICANCE AFTER MITIGATION	MITIGATION	IMPLEMENTED BY	WHEN IMPLEMENTED	MONITORED BY	VERIFIED BY AND DATE
3.4.2 (cont.)	The monitoring and reporting that is included in the geotechnical monitoring program shall occur quarterly, unless the RWQCB or the LEA determines that more frequent monitoring is needed, and will follow the frequency indicated in the WDRs and/or the SWFP.				
	3.4.2b: The geotechnical monitoring program developed by GeoSyntec to monitor fill placement shall be conducted under supervision of a geotechnical engineer familiar with landfill operations and the behavior of the underlying Bay Mud. Recommendations of the supervising engineer and activities conducted as part of the monitoring plan shall be documented and included in periodic reports submitted to the County of Marin and, if appropriate, the RWQCB.	Applicant	The project applicant shall implement this measure upon issuance of the revised SWFP.	Marin County EHS and RWQCB	Marin County EHS, CIWMB, and RWQCB, periodically
	3.4.2c: If refuse placement activities have stopped, due to indications of an increasing rate of deformation in the monitored slopes, as provided under Mitigation Measure 3.4.2a, and geotechnical monitoring continues to indicate exceedance of the threshold values, the supervising engineer shall implement one or more of the following measures to increase the factor of safety of the slope and be	Applicant	The project applicant shall implement this measure upon occurrence of conditions specified in the test of the mitigation measure.	Marin County EHS and RWQCB	Marin County EHS, CIWMB, and RWQCB, as needed
	within the geotechnical monitoring criteria described above: • remove refuse in critical areas to reduce the driving force of the slope; • construct a berm or install piles at the toe of the slope to provide resistance to slope movement; and/or • implement other engineering measure(s) to reduce the rate of deformation and prevent slope instability. The appropriate measure or measures to be undertaken shall be assessed by the geotechnical engineer supervising the geotechnical monitoring program, as specified under 3.4.2b.				

REDWOOD LANDFILL SOLID WASTE FACILITIES PERMIT REVISION
MITIGATION MONITORING AND REPORT PROGRAM (Continued)

IMPACT AND SIGNIFICANCE AFTER MITIGATION	MITIGATION	IMPLEMENTED BY	WHEN IMPLEMENTED	MONITORED BY	VERIFIED BY AND DATE
3.4.2 (cont.)	**3.4.2d:** Depending on findings of the geotechnical monitoring program, the fill sequencing plan shall be modified, as needed, to slow the rate of fill if Bay Mud strength is less than anticipated. The change in rate of fill shall be determined by quantitative threshold values that shall be incorporated into the geotechnical monitoring program. Any modifications to the fill sequencing plan shall be reported to the LEA and the RWQCB.	Applicant	The project applicant shall implement this measure upon occurrence of specified conditions.	Marin County EHS and RWQCB	Marin County EHS, CIWMB, and RWQCB, as needed
	3.4.2e: The geotechnical monitoring program shall include monitoring the rate of Bay Mud consolidation due to the weight of the overlying waste by the following method. The elevation of the bottom of LCRS riser LS1 located in Area G shall be recorded immediately before, and then periodically after, each lift of waste is placed in Area G. The observed rate of settlement will be compared with the predicted rate of settlement. The supervision, reporting, and remedial action elements of Mitigation Measures 3.4.2b through 3.4.2d shall also apply to this consolidation monitoring.	Applicant	The project applicant shall implement this measure upon occurrence of specified conditions.	Marin County EHS and RWQCB	Marin County EHS, CIWMB, and RWQCB, as needed
3.4.3: Differential settlement of the refuse and the underlying Bay Mud, causing cracks in the levee or final cover and damage to the LCRS, could occur as additional refuse is placed on the landfill. (LTS)	**3.4.3:** As part of the geotechnical monitoring program, the applicant will inspect quarterly for cracks in cover material and monitor pressure and volume changes in the landfill gas collection system. If measured settlement or deformation rates begin to increase, the inspection frequency will be increased to weekly. If monitoring reveals evidence of differential settlement, the following measures will be implemented, as needed: • if settlement cracks are observed in the levee or final cover, the cracks shall be re-graded to seal them; and • if the LCRS or landfill gas collection system is damaged, pipes shall be repaired and/or replaced.	Applicant	The project applicant shall implement this measure upon issuance of the revised SWFP and quarterly or more frequently (as described) thereafter.	Marin County EHS and RWQCB	Marin County EHS, CIWMB, and RWQCB, periodically

REDWOOD LANDFILL SOLID WASTE FACILITIES PERMIT REVISION MITIGATION MONITORING AND REPORT PROGRAM (Continued)

IMPACT AND SIGNIFICANCE AFTER MITIGATION	MITIGATION	IMPLEMENTED BY	WHEN IMPLEMENTED	MONITORED BY	VERIFIED BY AND DATE
3.4.4: Precipitation contacting the landfill cover and other unpaved areas of the landfill could generate storm water runoff with sufficient velocity to dislodge and transport soil and sediment, resulting in the formation of erosion features that could damage portions of the landfill. (LTS)	**3.4.4a:** RLI will maintain and implement a Storm Water Pollution Prevention Plan (SWPPP) as required under their storm water discharge permit. The SWPPP will provide necessary Best Management Practices that shall be implemented at the site to control storm water runoff and reduce erosion. RLI prepared a SWPPP (RLI, 2003) for compliance with Provision C.2 of the General Industrial Storm Water Discharge Permit issued by the State Water Resources Control Board (SWRCB) and enforced by the Regional Water Quality Control Board (RWQCB), San Francisco Bay Region. In addition, the landfill was designed in accordance with CCR Title 27, §20365, which (as outlined above) specifies requirements and performance standards for precipitation and drainage control for active Class III landfills (GeoSyntec, 1998).	Applicant	The project applicant has prepared an updated SWPPP in 2003, and shall continue to implement its provisions consistent with the specified regulations upon issuance of the revised SWFP.	Marin County EHS and RWQCB	Marin County EHS, CIWMB, and RWQCB, periodically
	3.4.4b: According to the applicant's SWPPP (RLI, 2000), sediment and erosion control features implemented include: • placement of yard waste and grass seeds on slopes to promote vegetation of slopes; • top deck berms; • collection inlets; • downdrain pipes; • hay bales; • silt fences; and • directing storm water flows to the main storm water impoundment in the southern part of the site or a 1/2 acre pond in the western-central portion of the site for settlement of suspended sediments prior to discharging offsite.	Applicant	The project applicant shall implement this measure upon issuance of the revised SWFP. The project applicant shall amend the SWPPP as specified.	Marin County EHS and RWQCB	Marin County EHS, CIWMB, and RWQCB, periodic inspections; verification of amended SWPPP upon its submission

REDWOOD LANDFILL SOLID WASTE FACILITIES PERMIT REVISION MITIGATION MONITORING AND REPORT PROGRAM (Continued)

IMPACT AND SIGNIFICANCE AFTER MITIGATION	MITIGATION	IMPLEMENTED BY	WHEN IMPLEMENTED	MONITORED BY	VERIFIED BY AND DATE
3.4.4 (cont.)	RLI has stated that the SWPPP will be amended whenever a change in design, construction, operation, or maintenance occurs that has a significant potential for pollutants to discharge to the adjacent waterways.				
	3.4.4c: A final landfill closure and post-closure maintenance and monitoring plan, as per federal and state regulations, will need to be implemented (GeoSyntec, 1998). Preliminary closure and post-closure plans were provided in the JTD (GeoSyntec, 1998). Preliminary closure and post-closure maintenance activities proposed to reduce the effects of surface water runoff and erosion were detailed in the JTD's Sections 8 and 9 and included: • Applicable final cover design to reduce infiltration and reduce surface water runoff velocity • Minimum grading requirements for the final cover • Environmental monitoring and control systems including final cover, surface water, and leachate management. According to GeoSyntec (1998), reporting requirements and schedule will be further defined in Final Closure and Post-Closure Maintenance Plans.	Applicant	The project applicant shall submit the final landfill closure and post-closure maintenance and monitoring plan by the deadline required in State regulations for submission of Final Closure and Post-Closure Maintenance Plans.	Marin County EHS and RWQCB	Marin County EHS, CIWMB, and RWQCB, upon submission of Plans
	3.4.4d: Prior to project implementation the applicant shall update the facility's SWPPP as needed to accurately reflect existing conditions and features and shall implement the plan upon project approval. Because Area G is to be developed as a disposal cell, the remaining 1/2 acre stormwater pond in this area, referenced in the 2003 revision of the SWPPP, will eventually be eliminated; such change shall be addressed in a timely revision of the SWPPP. As required by NPDES provisions, the revised SWPPP shall be kept on site and made available to RWQCB staff upon request.	Applicant	The project applicant shall implement this measure and submit a revised SWPPP to the Marin County EHS prior to project approval.	Marin County EHS and RWQCB	Marin County EHS, CIWMB, and RWQCB, prior to issuance of revised SWFP and periodically thereafter

REDWOOD LANDFILL SOLID WASTE FACILITIES PERMIT REVISION MITIGATION MONITORING AND REPORT PROGRAM (Continued)

IMPACT AND SIGNIFICANCE AFTER MITIGATION	MITIGATION	IMPLEMENTED BY	WHEN IMPLEMENTED	MONITORED BY	VERIFIED BY AND DATE
3.4.4 (cont.)	**3.4.4e:** To ensure that raw yardwaste used for erosion control on landfill side slopes does not become a source for the spread of invasive weed species into the adjoining marsh, Redwood Landfill shall undertake an invasive weed monitoring and control program. At the least, this program will consist of the following: 1. Prior to project approval, the applicant shall c~~C~~onduct a baseline survey of areas of the landfill where yardwaste has been applied for erosion control, and of the perimeter of the landfill, to determine the presence and extent of invasive weed species already established, if any; 2. Prior to project approval, the applicant shall r~~R~~emove invasive weeds that become established on the landfill property 3. The applicant shall continue to ~~and~~ monitor annually for presence of invasive weeds, and continue removal as necessary; ~~3. If after monitoring it is determined that use of raw yardwaste for erosion control at the site is not a source of invasive weed species, the frequency of monitoring may be reduced and/or the control program discontinued.~~ 4. ~~Alternatively,~~ In addition, Redwood Landfill could ~~may~~ substitute composted or heat-sterilized yardwaste that does not contain viable weed seeds for raw yardwaste.	Applicant	The project applicant shall implement the baseline survey prior to project approval and shall implement other provisions as specified in the text of the mitigation measure.	Marin County EHS and RWQCB	Marin County EHS, CIWMB, and RWQCB, prior to issuance of revised SWFP and periodically thereafter
3.4.5: The existing surface drainage system may be inadequate for a Class III landfill. (Significant)	**3.4.5:** Implement Mitigation Measure 3.5.9 (i.e., the applicant shall produce and present to the RWQCB for approval a report demonstrating that precipitation and drainage control facilities meet Title 27 requirements, and provide a copy of the report to the LEA).	See referenced mitigation measure.			

REDWOOD LANDFILL SOLID WASTE FACILITIES PERMIT REVISION MITIGATION MONITORING AND REPORT PROGRAM (Continued)

IMPACT AND SIGNIFICANCE AFTER MITIGATION	MITIGATION	IMPLEMENTED BY	WHEN IMPLEMENTED	MONITORED BY	VERIFIED BY AND DATE
3.4.6: A five-foot separation does not exist between the base of the landfill and the underlying groundwater. (LTS)	**3.4.6:** The applicant has proposed a leachate collection and removal system (LCRS) as an engineered alternative to the Title 27 requirement of a minimum separation of five feet between waste and groundwater (GeoSyntec, 1998). According to the applicant, the cost to modify the landfill to meet the five-foot separation requirement would be too great; thus the applicant has filed an exemption request with the RWQCB (GeoSyntec, 1998). Title 27 provides for consideration of engineering alternatives if the minimum five-foot separation between the landfill and underlying groundwater is not possible or would be prohibitively expensive to provide. As described in the Joint Technical Document (GeoSyntec, 1998), the underlying Bay Mud has relatively low permeability (less than 10^{-6} cm/s) and the thickness of the Bay Mud deposit ranges from 7 to 45 feet within the landfill's footprint. Given the thickness of the Bay Mud, its low permeability, and the preferential flow direction of the leachate along the refuse-Bay Mud interface, significant migration of leachate below the site would not occur. The landfill's LCRS (described in greater detail below, under Impact 3.4.7) would intercept leachate flowing along the refuse-Bay Mud interface, and the leachate would be pumped to the onsite leachate pond. The results of a study on a perimeter LCRS and its effect on leachate migration (MET and Sanifill, 1995a) indicate the preferential flow of the leachate for the entire site would be towards the perimeter LCRS. Therefore, because the LCRS prevents the contamination of the underlying groundwater by directing the leachate flow away from the underlying groundwater, the design can be considered an adequate engineered alternative to the five feet separation requirement (Treadwell & Rollo, 2002).	Applicant	The applicant has implemented this measure: the LCRS has been constructed and the RWQCB has approved the LCRS as an engineered alternative as provided under Title 27. See also Measure 3.4.7a-k. .	Marin County EHS and RWQCB	Marin County EHS, CIWMB and RWQCB, upon completion of each new LCRS segment

REDWOOD LANDFILL SOLID WASTE FACILITIES PERMIT REVISION MITIGATION MONITORING AND REPORT PROGRAM (Continued)

IMPACT AND SIGNIFICANCE AFTER MITIGATION	MITIGATION	IMPLEMENTED BY	WHEN IMPLEMENTED	MONITORED BY	VERIFIED BY AND DATE
3.4.7: If not properly designed, the proposed Leachate Collection and Recovery System (LCRS) could allow leachate to migrate off-site and potentially contaminate off-site groundwater and surface water. (LTS)	**3.4.7a:** According to the applicant, leachate is managed at the existing facility in accordance with the RWQCB-approved Leachate Management Plan prepared by CH2MHill (1992) (GeoSyntec, 1998). The Joint Technical Document (GeoSyntec, 1998) description of existing leachate management includes the following activities to minimize the production of leachate and promote the reuse of collected leachate. Although not explicitly stated in Chapter 6 (Proposed Facility Modifications) of the Joint Technical document, this analysis assumes these practices will be continued with the proposed project. • placement of well-compacted, vegetation-free intermediate cover (defined in 27 CCR §20164 as cover material placed on all fill surfaces where additional cells are not to be constructed for 180 days or more, to control vectors, fires, odors, blowing litter, scavenging, and drainage) over the refuse; • grading of daily, intermediate, and final cover to minimum 3 percent slopes to promote surface-water runoff from the landfill; • installation and continuous operation of a perimeter LCRS around the landfill; • placement of final cover in phases throughout the life of the landfill as final grades are reached; and • use of collected leachate for dust control on access roads and intermediate covers as approved by regulatory agencies.	Applicant	The project applicant has already implemented this measure as part of existing operations and shall continue to implement this measure upon issuance of the revised SWFP.	Marin County EHS and RWQCB	Marin County EHS, CIWMB, and RWQCB, periodic inspections
	3.4.7b: To address the issue of leachate leakage from the leachate pond, RLI prepared a Leachate Facilities Leak or Spill Contingency Plan (RLI, 1995b). RLI site operations personnel routinely monitor the leachate pond in association with daily activities and the site operations supervisor performs weekly formal monitoring/inspection.	Applicant	The project applicant prepared a Leachate Facilities Leak and Spill Contingency Plan in 1995 and shall continue to implement	Marin County EHS and RWQCB	Marin County EHS, CIWMB, and RWQCB, periodic inspections

REDWOOD LANDFILL SOLID WASTE FACILITIES PERMIT REVISION MITIGATION MONITORING AND REPORT PROGRAM (Continued)

IMPACT AND SIGNIFICANCE AFTER MITIGATION	MITIGATION	IMPLEMENTED BY	WHEN IMPLEMENTED	MONITORED BY	VERIFIED BY AND DATE
3.4.7 (cont.)			specified monitoring and inspection upon issuance of the revised SWFP, consistent with Measure 3.4.7f requirements to update the Plan.		
	3.4.7c: Following a significant seismic or rare rainfall event, RLI will initiate an immediate inspection of the leachate pond containment facilities as part of their contingency measures. If any noticeable damage is observed during these inspections, landfill or contracted equipment will be used to repair and control all minor leaks. If a major leak is evident, Redwood will take the following immediate measures to ensure control of the leachate release (RLI, 1995b): • construction of a dike using available soil; • construction of temporary berms; • excavation of additional channels; • construction of a temporary leachate storage pond in the Oxbow area (the Leachate Facilities Leak or Spill Contingency Plan identifies Fields 2 and 3 and the narrow strip between the eastern edge of the existing leachate pond and Field 5 as the location of the contingent leachate pond); and • pump water into onsite ponds as emergency disposal of "clean" leachate in heavy rainfall. (The Leachate Facilities Leak and Spill Contingency Plan, produced in 1995 [RLI, 1995b], does not identify specific "onsite ponds" to which it refers. The plan states that additional pond storage capacity was planned at the time, through the construction of an additional leachate storage/ evaporation pond in the summer of 1996.)	Applicant	The project applicant shall implement this measure as needed, as specified in the text of this mitigation measure.	Marin County EHS and RWQCB	Marin County EHS, CIWMB, and RWQCB, as needed

REDWOOD LANDFILL SOLID WASTE FACILITIES PERMIT REVISION MITIGATION MONITORING AND REPORT PROGRAM (Continued)

IMPACT AND SIGNIFICANCE AFTER MITIGATION	MITIGATION	IMPLEMENTED BY	WHEN IMPLEMENTED	MONITORED BY	VERIFIED BY AND DATE
3.4.7 (cont.)	**3.4.7d:** If groundwater monitoring performed as part of the self-monitoring program detects leachate outside the perimeter levee, RLI shall follow Title 27 CCR regulations (e.g., Section 20385 et seq.) and work with the RWQCB in the development of an Evaluation Monitoring Plan and/or an Engineering Feasibility Study to determine the appropriate site specific methods for evaluating the scope of a release, its mitigation, and subsequent monitoring program or corrective action program pursuant to 27 CCR Section 20385 and Section 20430. The following contingency measures may be appropriate and would be implemented if needed and in coordination with RWQCB requirements: • Installation of a geosynthetic membrane across the length of a trench constructed in the targeted zone along the site perimeter to contain the release. The geosynthetic barrier would reduce the rate of off-site migration of the release while also reducing groundwater inflow to the collection system. • Collection of the leachate by installing a French drain in the trench. A sump in the trench would be pumped to prevent hydraulic head buildup up-gradient of the containment barrier. Mitigation monitoring locations in Bay Mud, refuse, and surface water will determine the necessity for implementing the mitigation measures outlined for this impact (i.e., increase in leachate extraction rate, contingency measures for capture of leachate migration). Financial assurance for the system to capture and/or contain leachate release beyond the perimeter levee would be provided for by applicant insurance.	Applicant	The project applicant shall implement this measure as specified upon issuance of revised SWFP. Any corrective action needed as indicated by the monitoring shall be implemented as required. The applicant shall implement the measures as specified in 27 CCR 20385 et seq.	Marin County EHS and RWQCB	Marin County EHS, CIWMB, and RWQCB, periodic inspections and as needed

REDWOOD LANDFILL SOLID WASTE FACILITIES PERMIT REVISION MITIGATION MONITORING AND REPORT PROGRAM (Continued)

IMPACT AND SIGNIFICANCE AFTER MITIGATION	MITIGATION	IMPLEMENTED BY	WHEN IMPLEMENTED	MONITORED BY	VERIFIED BY AND DATE
3.4.7 (cont.)	**3.4.7e:** The applicant has completed installation of the LCRS at Areas E and F, thus completing the perimeter LCRS. To further limit the potential for significant leachate accumulation in the landfill, RLI shall undertake a leachate pumping program in coordination with the RWQCB whereby leachate is initially extracted from up to 13 existing landfill gas wells in the interior of the landfill. The pumping shall be selectively monitored for pumping times, rates and recovery to determine well productivity and effectiveness for use in future additions to the pumping program. Chemistry tests on pumped liquids will be selectively conducted to determine the source of gas well liquid in order to differentiate between leachate and groundwater. Additional dual leachate/gas collection wells shall be installed to the base of the landfill or to sea level, whichever is higher, and shall be equipped with leachate extraction pumps. The number and spacing of leachate extraction wells shall be augmented each year until a consistent decrease in leachate volume can be empirically verified and is sufficient to achieve the long-term objective of removing the leachate mound. Empirical verification of initial leachate volume reduction and verification that an appropriate number of wells and pumps have been installed shall be provided to the RWQCB and shall include the satisfaction of the following performance criteria: 1) Demonstrate, using a refined water balance model approved by the RWQCB, that the leachate extraction rate exceeds the leachate generation rate; and 2) Demonstrate a measurable and quantifiable decrease in leachate volume within the landfill using leachate elevation measurements from either monitoring wells or landfill gas extraction wells located in the interior of the landfill.	Applicant	The applicant has completed installation of the perimeter LCRS as indicated. The project applicant has initiated the program of pumping from the interior of the landfill and shall continue to implement this measure as specified, upon issuance of the revised SWFP.	RWQCB and Marin County EHS	RWQCB and Marin County EHS, CIWMB; Efficiencies to be demonstrated within 5 years

REDWOOD LANDFILL SOLID WASTE FACILITIES PERMIT REVISION MITIGATION MONITORING AND REPORT PROGRAM (Continued)

IMPACT AND SIGNIFICANCE AFTER MITIGATION	MITIGATION	IMPLEMENTED BY	WHEN IMPLEMENTED	MONITORED BY	VERIFIED BY AND DATE
3.4.7 (cont.)	Once it has been established that the leachate collection and removal system size and pumping rate is sufficient to reduce the leachate volume, the system shall be maintained and operated such that leachate volume is steadily reduced. Leachate levels shall be reduced to a sustainable level over a period of 5 years. The achievement of the sustainable level shall be empirically verified by the achievement of at least one of the following three performance criteria: 1) Demonstrate that the piezometric head in the basal (laterally continuous) leachate is no greater than 1 ft MSL; 2) Demonstrate that the extracted leachate is chemically indistinguishable from the groundwater in the vicinity of the landfill; or 3) Demonstrate that an inward gradient has been achieved such that leachate flows from the perimeter of the landfill towards the center of the landfill The performance criteria evaluations shall account for seasonal fluctuations and be capable of demonstrating performance achievement on a year-to-year basis				
	3.4.7f: RLI shall update its Leachate Facilities Leak or Spill Contingency Plan to accommodate proposed project changes. At a minimum, the revised plan shall address the following issues: (1) Areas in the Oxbow shown in the existing plan (RLI, 1995b) as the location of the contingent leachate pond (Fields 2 and 3 and the narrow strip between the eastern edge of the existing leachate pond and Field 5) are proposed under the project to be used for composting and co-composting, and Fields 3, 4, and 5 are proposed under the project to be used for composting, co-composting, and are "also available for Class II leachate impoundments." The revised leachate contingency plan shall identify which area or areas will be used for	Applicant	The applicant shall prepare and submit the updated Leachate Facilities Leak or Spill Contingency Plan to the Marin EHS and RWQCB, prior to project approval and complete all necessary improvements as specified.	Marin County EHS and RWQCB	Marin County EHS, CIWMB, and RWQCB, upon submission of updated Plan

REDWOOD LANDFILL SOLID WASTE FACILITIES PERMIT REVISION MITIGATION MONITORING AND REPORT PROGRAM (Continued)

IMPACT AND SIGNIFICANCE AFTER MITIGATION	MITIGATION	IMPLEMENTED BY	WHEN IMPLEMENTED	MONITORED BY	VERIFIED BY AND DATE
3.4.7 (cont.)	contingent leachate storage or, alternatively, explain/clarify how composting operations and emergency leachate storage will be accommodated in the same area. The updated leachate contingency plan shall demonstrate that the compost operation shall be isolated from and not affected by use of any area as a contingency/emergency leachate impoundment. (Refer to Mitigation Measures 3.5.3a, 3.5.3b, and 3.5.3d regarding leachate potentially generated at these new composting areas.) (2) Because an additional leachate storage/evaporation pond that, according to the 1995 Leachate Facilities Leak and Spill Contingency Plan (RLI, 1995b), was to have been constructed in the summer of 1996 to provide additional pond storage capacity, has not been constructed, yet additional capacity has been shown to be needed to prevent overflow during especially wet months, the revised plan shall indicate RLI's plans to provide additional leachate storage capacity. To address revisions to the estimates of the depth and capacity of the existing pond reflected in each of the last three annual monitoring reports, the plan shall also include an updated calculation of the capacity of the existing pond based on a survey of the pond area and depth, conducted by a licensed surveyor. (3) With regard to potential overtopping of the leachate pond during periods of extreme rainfall, the 1995 plan indicated that pumping directly into San Antonio Creek, if leachate water was confirmed to be clean, was the most effective contingency measure to quickly evacuate the leachate pond. The updated leachate contingency plans shall not rely on such a measure for leak or spill contingencies, but shall include other contingency measures as discussed under item (1), above (i.e., identification of the location of on-site contingent impoundments), that prevent the off-site release of				

REDWOOD LANDFILL SOLID WASTE FACILITIES PERMIT REVISION MITIGATION MONITORING AND REPORT PROGRAM (Continued)

IMPACT AND SIGNIFICANCE AFTER MITIGATION	MITIGATION	IMPLEMENTED BY	WHEN IMPLEMENTED	MONITORED BY	VERIFIED BY AND DATE
3.4.7 (cont.)	leachate. Any such on-site impoundment(s) designated to receive leachate shall be constructed to meet applicable state standards for leachate impoundments. (4) The updated Leachate Facilities Leak or Spill Contingency Plan shall specify that the landfill shall notify the LEA and the RWQCB immediately upon detection of a leachate leak or spill. The updated Leachate Facilities Leak or Spill Contingency Plan shall be submitted to the LEA and the RWQCB prior to project approval. Approval of use of Oxbow areas for composting, other than Field 2, where the applicant commenced composting on a new pad in 2005, shall be conditioned upon approval of the updated leachate contingency plan, in addition to other relevant approvals required as mitigations in this report. All necessary improvements identified in the updated Leachate Facilities Leak or Spill Contingency Plan, including but not limited to the construction of additional Class II leachate impoundments, measures to isolate the composting facility from leachate impoundments, and any other facilities required to ensure adequate leachate storage capacity under both normal and extreme weather circumstances, shall be completed within one year of issuance of the revised Solid Waste Facility Permit. Construction of such facilities will be subject to Construction Quality Assurance monitoring and reporting. Upon completion of all facilities, the applicant shall submit a report of completion to the RWQCB and the LEA.				
	3.4.7g: To more clearly demonstrate the effectiveness of the LCRS perimeter trench, RLI shall implement a continuous hydraulic gradient monitoring program, through at least one above-average wet season, ~~or~~ and until a gradient toward the trench is consistently demonstrated ~~(whichever occurs later)~~, through the use of automatic	Applicant	The project applicant shall implement this measure upon issuance of the revised SWFP and as specified.	Marin County EHS and RWQCB	Marin County EHS, CIWMB, and RWQCB as specified

REDWOOD LANDFILL SOLID WASTE FACILITIES PERMIT REVISION
MITIGATION MONITORING AND REPORT PROGRAM (Continued)

IMPACT AND SIGNIFICANCE AFTER MITIGATION	MITIGATION	IMPLEMENTED BY	WHEN IMPLEMENTED	MONITORED BY	VERIFIED BY AND DATE
3.4.7 (cont.)	devices to measure and record water level (water level loggers) as described herein. All such devices will be set to record a measurement at least every 15 minutes: • Water level loggers shall be installed and maintained at each of the transects currently established to monitor hydraulic gradient. • A piezometer transect consisting of one piezometer located within the landfill (inboard of the trench), one piezometer within the perimeter trench, and one piezometer outboard of the trench shall be constructed in landfill Area F, which currently does not have such a piezometer cluster. Water level loggers shall be installed and maintained in the newly constructed piezometers and set for continuous monitoring. • Water level loggers shall be installed and maintained in sand channel monitoring wells G-18, MWH-24, MWH-9 and piezometer P-2R. • Water level loggers (or stage recorders) shall be installed and maintained in San Antonio Creek and one of the sloughs adjacent to the landfill footprint.				
	RLI shall compile data recorded by the water level loggers and notify the LEA and RWQCB within 14 days in the event that monitoring indicates a gradient away from the trench. If monitoring indicates a consistent gradient toward the trench, monitoring results shall be reported as part of the facility's annual Leachate Management and Monitoring Report. If monitoring reveals evidence of a gradient away from the trench, RLI shall evaluate the potential cause(s) of the reversed gradient and implement measures to remediate the problem and provide a consistent gradient toward the LCRS trench. RLI and its geotechnical consultant, GeoSyntec, have proposed the following remedial measures				

REDWOOD LANDFILL SOLID WASTE FACILITIES PERMIT REVISION MITIGATION MONITORING AND REPORT PROGRAM (Continued)

IMPACT AND SIGNIFICANCE AFTER MITIGATION	MITIGATION	IMPLEMENTED BY	WHEN IMPLEMENTED	MONITORED BY	VERIFIED BY AND DATE
3.4.7 (cont.)	if monitoring indicates a gradient away from the trench (RLI and GeoSyntec, 2006). Remediation measures may include, but would not be limited to, the following: • Grading and surface water control features shall be observed to assess the possibility that surface water infiltration has occurred. RLI shall implement additional grading, piping, or other surface water control features if deemed necessary. • Pump inlets shall be lowered at the two nearest sump locations to increase the gradient and associated discharge within the trench. • If the two preceding measures do not result in resumption of a demonstrated inward gradient (toward the LCRS trench), RLI shall install and connect to the existing system an additional trench sump and discharge system. • If none of the above measures result in a resumption of demonstrated inward gradient toward the LCRS trench, RLI shall seek approval from the RWQCB to address the situation through an engineered solution such as deepening the extraction trench or constructing a subsurface cut-off wall. In addition, if an outward gradient is detected, RLI shall seek direction from the RWQCB to determine whether additional water quality or water level monitoring locations or methods are required.				
	3.4.7h: A backup power generator capable of powering the LCRS sump pumps and other basic facilities needed to ensure the continuing effectiveness of the landfill's environmental controls, shall be maintained at the landfill site. Adequate fuel to power the generator shall be maintained consistent with all applicable regulations and permit requirements.	Applicant	The project applicant shall implement this measure prior to project approval.	Marin County EHS, RWQCB	Marin County EHS, RWQCB, periodically

REDWOOD LANDFILL SOLID WASTE FACILITIES PERMIT REVISION MITIGATION MONITORING AND REPORT PROGRAM (Continued)

IMPACT AND SIGNIFICANCE AFTER MITIGATION	MITIGATION	IMPLEMENTED BY	WHEN IMPLEMENTED	MONITORED BY	VERIFIED BY AND DATE
3.4.7 (cont.)	**3.4.7i:** The applicant shall, through historical research and site investigations, map the location and dimensions (including depth) of all trench fills located at the site. The applicant shall undertake any necessary subsurface investigations to ascertain whether any trench fills were excavated into the Pleistocene Alluvium underlying the Bay Mud. If not, no further action is required. If so, the applicant shall develop and implement a plan to correct this condition. The plan shall be reviewed and approved by the RWQCB. The plan may entail: a. installation of leachate extraction wells at sufficient frequency and depth within the old trenches to prevent downward migration of leachate into the underlying alluvium; b. excavation of all waste from the trench and replacement with a liner that meets current regulatory standards; or c. another engineered solution.	Applicant	The project applicant shall conduct the initial site investigation and submit a report summarizing the investigation to the Marin County EHS and RWQCB within two years of issuance of revised SWFP. If corrective action is required, the applicant shall develop and submit the specified corrective action plan to the RWQCB consistent with provisions of state regulations and implement the plan upon RWQCB approval.	Marin County EHS, RWQCB	Marin County EHS, RWQCB
	3.4.7j: The applicant shall implement an improved program to monitor groundwater within the Pleistocene Alluvium that underlies the Bay Mud. In consultation with the RWQCB, the applicant shall locate and install additional wells, screened in the alluvium, to augment the existing wells (currently there are 4 wells in the alluvium – P-10, P-6B, P-5B, MWH-25R). Since the gradient within the alluvium is tidally influenced, the network will include both wells that are in locations that are at least at times down-gradient of the landfill, as well as reference wells that are never down gradient of the landfill, but which otherwise exhibit similar hydrogeologic characteristics and water	Applicant	The project applicant shall implement the groundwater monitoring requirements of this measure within one year of issuance of revised SWFP. If monitoring indicates that corrective action is required, the	Marin County EHS, RWQCB	Marin County EHS, RWQCB

REDWOOD LANDFILL SOLID WASTE FACILITIES PERMIT REVISION MITIGATION MONITORING AND REPORT PROGRAM (Continued)

IMPACT AND SIGNIFICANCE AFTER MITIGATION	MITIGATION	IMPLEMENTED BY	WHEN IMPLEMENTED	MONITORED BY	VERIFIED BY AND DATE
3.4.7 (cont.)	chemistry. A sufficient number of wells shall be installed to ensure that localized inconsistencies in the hydrogeologic system are considered, and that monitoring data characterize the quality of groundwater under both reference conditions and that which could be contaminated by leachate from the landfill. A sampling and analysis plan, including schedule, shall be developed in consultation with the RWQCB, and monitoring results will be added to the facility's semi-annual and annual monitoring reports to the RWQCB. If monitoring reveals that contamination is occurring in the alluvium, the applicant shall develop a remediation plan. The remediation plan shall be reviewed and approved by the RWQCB. Remediation may entail pump and treat methods, treat-in-place methods, or other methods approved by the RWQCB. Treatment shall continue as long as contamination is present or until a water quality objective established by the RWQCB is met.		applicant shall develop a corrective action plan and submit it to the RWQCB as specified in state regulations. The applicant shall implement corrective actions upon RWQCB approval.		
	3.4.7k: Following closure of the landfill, the applicant shall continue to operate and maintain the LCRS, including extraction of fluid from the LCRS trench and from interior wells. To demonstrate the effectiveness of the LCRS post-closure, the applicant shall verify that one of the following conditions is met: 1) Demonstrate that the piezometric head in the basal (laterally continuous) leachate is no greater than 1 ft MSL; 2) Demonstrate that the extracted leachate is chemically indistinguishable from the groundwater in the vicinity of the landfill. Until it can be demonstrated that condition 2 is met consistently over a 3-year period, the applicant shall continue to operate and maintain the LCRS, and to maintain and monitor the sand channel and Pleistocene	Applicant	The applicant shall implement this measure during the post-closure period as specified.	Marin County EHS, RWQCB	Marin County EHS, CIWMB, and RWQCB, as specified [with quarterly or semi-annual report?]

REDWOOD LANDFILL SOLID WASTE FACILITIES PERMIT REVISION MITIGATION MONITORING AND REPORT PROGRAM (Continued)

IMPACT AND SIGNIFICANCE AFTER MITIGATION	MITIGATION	IMPLEMENTED BY	WHEN IMPLEMENTED	MONITORED BY	VERIFIED BY AND DATE
3.4.7 (cont.)	Alluvium monitoring wells at the site. Because it may be necessary to continue to operate and maintain the LCRS, and to monitor wells beyond the 30-year post-closure period specified in the JTD, the applicant shall prepare a revised Preliminary Post-Closure Maintenance Plan that plans for and provides financial assurances for perpetual maintenance of these environmental control and monitoring systems. Financial assurances shall meet the requirements of California Code of Regulations Title 27, Chapter 6, and shall be sufficient for the entire cost of closure and post-closure maintenance.				
3.4.8: The increased generation of leachate that would result from the project could surpass the capacity of the LCRS, resulting in the off-site release of leachate and the contamination of off-site groundwater. (LTS)	**3.4.8a:** The applicant proposes to use leachate that tests "clean," according to standards established by the RWQCB, for composting quench water, if approved.	Applicant	The applicant shall implement this measure only upon issuance of revised WDRs specifically approving this practice.	Marin County EHS and RWQCB	Marin County EHS, CIWMB, and RWQCB, approval prior to issuance of revised SWFP and WDRs; periodic inspections thereafter
	3.4.8b: The applicant has installed a leachate vaporator to destroy collected leachate, as part of the facility's LCRS. The vaporator has not previously been evaluated and is a component of the project evaluated in this EIR. In addition, actions undertaken as part of Mitigation Measures 3.4.7a, including the grading of slopes to promote runoff, the timely placement of intermediate and final cover, and the use of leachate for dust control, would help enhance LCRS capacity by limiting leachate generation and making use of the leachate that is generated.	Applicant	The project applicant has discontinued use of the leachate vaporator. In its November 2004 application to the BAAQMD, RLI requested that the vaporator be taken out of the facility's air permits.	Marin County EHS, BAAQMD, and RWQCB	Marin County EHS, CIWMB, BAAQMD, and RWQCB, periodic inspections

REDWOOD LANDFILL SOLID WASTE FACILITIES PERMIT REVISION MITIGATION MONITORING AND REPORT PROGRAM (Continued)

IMPACT AND SIGNIFICANCE AFTER MITIGATION	MITIGATION	IMPLEMENTED BY	WHEN IMPLEMENTED	MONITORED BY	VERIFIED BY AND DATE
3.4.8 (cont.)	**3.4.8c:** RLI shall update their Leachate Management Plan so that, at a minimum, a single Leachate Management Plan serves as the current plan for the landfill. The plan shall be consistent with all aspects of the applicant's proposed project and with mitigation measures identified in this SEIR, including the currently-proposed LCRS design; management practices to limit leachate production and manage the leachate that is generated; and the most current leachate flow rates based on the proposed LCRS design, the most recent and comprehensive leachate generation studies, and empirical data of actual leachate flow rates since installation of the LCRS. The Plan shall demonstrate that the LCRS components and leachate impoundment(s) provide adequate capacity as required under 27 CCR §20340 (i.e., twice the maximum daily volume anticipated), including adequate conveyance and storage capacity during the wettest months of the year. (The MET/Sanifill analysis [1995a] indicated that seasonal flow rates may be as much as 4 to 5 times the calculated values for long-term and short-term flows, for one or two months each year.) The updated plan shall address and remedy the current situation in which a 1992 study and plan is cited for leachate management practices and the LCRS design (but not for the leachate flow rates it presents), a 1995 study is cited for leachate flow rates, although these rates are inconsistent with reported actual use, and estimates of the quantity of leachate expected to be utilized or consumed by various landfill facilities and activities are not provided in a discussion of system capacity, if at all. In demonstrating that adequate leachate capacity exists to prevent the off-site discharge of leachate, the updated plan shall include a complete water balance model that shows quantitatively (using both actual flow rates from operation of the LCRS to	Applicant	The project applicant shall submit the updated Leachate Management Plan prior to project approval. The project applicant shall review the Plan annually and revise and update it as specified; results of the annual review and any proposed revisions shall be submitted to the RWQCB for approval upon completion of the review. The project applicant shall concurrently submit a copy of the RWQCB submittal to the Marin EHS.	RWQCB, Marin County EHS	RWQCB, Marin County EHS, CIWMB, upon submission of updated Plan and prior to project approval; Annual updates to the Leachate Management Plan; Monitoring results submitted quarterly to RWQCB and Marin County EHS

REDWOOD LANDFILL SOLID WASTE FACILITIES PERMIT REVISION MITIGATION MONITORING AND REPORT PROGRAM (Continued)

IMPACT AND SIGNIFICANCE AFTER MITIGATION	MITIGATION	IMPLEMENTED BY	WHEN IMPLEMENTED	MONITORED BY	VERIFIED BY AND DATE
3.4.8 (cont.)	date, as well as estimated projections) the amount of leachate that is expected to be generated and how it is managed to prevent any off-site discharges. The water balance model shall include any elements that are expected by the applicant to be considered by permitting agencies in their assessment of the leachate system's capacity (e.g., the anticipated quantities of leachate to be used for dust control and quench water [if approved], and the basis for such estimates, if these are to be considered in the assessment of system capacity). The Leachate Management Plan shall incorporate elements of the report required by Mitigation Measure 3.5.4 (concerning composting contact water) to ensure that the plan also addresses leachate generated by the expanded composting operations. The updated Leachate Management Plan shall be submitted to the LEA and RWQCB prior to project approval. RLI shall review annually and if necessary revise the updated Leachate Management Plan, including the water balance model, taking into consideration monitoring results that RLI collects and presents quarterly to the RWQCB and the LEA. These monitoring data shall include the amount of leachate extracted from the landfill, the elevation of leachate within monitoring and extraction wells, and the disposition of collected leachate. RLI shall present the results of the annual review and any revisions to the RWQCB for approval, with a copy sent to the LEA. In addition, the implementation of Mitigation Measure 3.4.7f, updating the landfill's Leachate Facilities Leak and Spill Contingency Plan, will help ensure that adequate capacity exists in the event of a leak in the existing pond.				

REDWOOD LANDFILL SOLID WASTE FACILITIES PERMIT REVISION MITIGATION MONITORING AND REPORT PROGRAM (Continued)

IMPACT AND SIGNIFICANCE AFTER MITIGATION	MITIGATION	IMPLEMENTED BY	WHEN IMPLEMENTED	MONITORED BY	VERIFIED BY AND DATE
3.4.9: Proposed modifications to the final cover design could adversely impact landfill stability or result in the degradation of groundwater or surface water quality. (LTS)	**3.4.9a:** To ensure the adequacy of cover materials to resist sliding (failure) under static or dynamic conditions, RLI's geotechnical consultants established the degree of shear strength (resistance to shear, or deformation in a direction parallel to planes of contact) any material used for the cover would need to possess (GeoSyntec, 1998). The required shear strength of a cover material (expressed as the angle of friction, where the lower the angle of friction the weaker is the material and vice versa) varies depending on whether or not seepage would be present, the cohesion of the materials within each layer, and the degree of adhesion between layers in contact. Materials used for the final cover would require the following specified degrees of shear strength. To maintain a static factor of safety against sliding, assuming no seepage, each of the cover materials must have shear strengths of friction angle ϕ greater than 34°, if no cohesion is present, or friction angle ϕ greater than 9°, if 50 lb/ft^2 of cohesion is present. Intermediate values of friction angle ϕ are required for cohesion between 0 and 50 lb/ft^2. Each material interface must have similar shear strength requirements for friction angle δ and adhesion. If seepage is encountered through the entire thickness of the vegetative cover, the required shear strengths become more restrictive. Without cohesion/adhesion, friction angles in excess of 49° would be required, while 50 lb/ft^2 of cohesion/adhesion reduces the requirement to 3°. Because it is unlikely that a 49° friction angle could be achieved with conventional cover materials, only materials that have sufficient cohesion and interfaces with sufficient adhesion will be used. The drainage layer will be properly designed to prevent seepage forces through the entire depth of the vegetative layer and will reduce the shear strength requirement for the long term seepage condition.	Applicant	The project applicant shall implement this measure following issuance of a revised SWFP.	Marin County EHS, RWQCB	Marin County EHS, CIWMB, and RWQCB, during and after construction

REDWOOD LANDFILL SOLID WASTE FACILITIES PERMIT REVISION MITIGATION MONITORING AND REPORT PROGRAM (Continued)

IMPACT AND SIGNIFICANCE AFTER MITIGATION	MITIGATION	IMPLEMENTED BY	WHEN IMPLEMENTED	MONITORED BY	VERIFIED BY AND DATE
3.4.9 (cont.)	To prevent permanent seismic displacement in excess of 12 inches, the cover shear strength friction angles must exceed 34° in the absence of cohesion/adhesion and must exceed 9° when coupled with 50 lb/ft^2 cohesion/ adhesion (GeoSyntec, 1998).				
	3.4.9b: Preconstruction testing will be conducted to ensure that the minimum material strength is achieved.	Applicant	The project applicant shall implement this measure and submit test results to the Marin EHS and RWQCB in conjunction with related cover material tests as indicated for Measure 3.4.9b.	Marin County EHS, RWQCB	Marin County EHS, CIWMB, and RWQCB, to review results of testing prior to construction
3.4.10: The proposed increase in the acceptance rate for designated waste could result in groundwater contamination from escaping leachate and waste. (Significant)	**3.4.10a:** The applicant has constructed a perimeter trench LCRS and has agreed to augment the leachate collection system by pumping from wells located in the interior of the landfill (see Mitigation Measure 3.4.7g).	Applicant	The project applicant shall implement Measure 3.4.7g, as specified for that measure (upon issuance of the revised SWFP and as specified).	RWQCB, Marin County EHS	RWQCB, Marin County EHS, CIWMB, to monitor during and after construction
	3.4.10b: Maintain receipt of designated waste at currently permitted levels.	Applicant	The project applicant shall submit documentation of planned receipt levels consistent with this measure prior to project approval and shall implement receipt provisions upon issuance of the revised SWFP.	Marin County EHS and RWQCB	Marin County EHS, CIWMB, and RWQCB, prior to issuance of revised SWFP and WDRs, and ongoing

REDWOOD LANDFILL SOLID WASTE FACILITIES PERMIT REVISION MITIGATION MONITORING AND REPORT PROGRAM (Continued)

IMPACT AND SIGNIFICANCE AFTER MITIGATION	MITIGATION	IMPLEMENTED BY	WHEN IMPLEMENTED	MONITORED BY	VERIFIED BY AND DATE
3.4.10 (cont.)	**3.4.10c:** The applicant could construct a cell that meets Title 27 prescriptive standards for a Class II cell and seek to permit it as such, and, if the cell was so permitted, seek to change the quantity of designated waste received.	RWQCB, Marin County EHS, CIWMB	Implementation of this measure would require submittal, review, and approval of a new application for a revised SWFP.	RWQCB, Marin County EHS, CIWMB	RWQCB, Marin County EHS, CIWMB, upon receipt of application
3.4.11: The proposed management of the buried waste in the southwest corner could result in soil or groundwater contamination. (LTS)	**3.4.11a:** Prior to landfill closure, the applicant shall prepare and submit for approval to the RWQCB and the LEA a final Closure and Post-Closure Maintenance plan for this waste unit as required under Title 27, Chapter 3, Subchapter 5, Closure and Post Closure Maintenance. The Closure and Post-Closure plan shall demonstrate that the proposed alternative final cover design and existing base underlying the waste unit, in conjunction with post-closure monitoring, will continue to isolate the waste in the 11.5-acre unit and prevent the degradation of groundwater. The closure and post-closure plan shall demonstrate that the proposed alternative final cover will continue to isolate the waste in this unit from precipitation and irrigation waters at least as well as would a final cover built in accordance with applicable prescriptive standards. This measure is consistent with Title 27 §21090, which provides that the RWQCB can allow any alternative final cover design that it finds will continue to isolate the waste in the unit from precipitation and irrigation waters at least as well as would a final cover built in accordance with applicable prescriptive standards. The closure and post-closure plan also shall demonstrate that the proposed alterative liner (i.e., the materials underlying the waste unit) will meet the performance criteria for containing waste and preventing the degradation of waters of the state required under Title 27 Section 20310. The description of the proposed alternative liner will include information on the geologic unit(s) (including thicknesses thereof) underlying the refuse across the 11.5-acre unit. Technical data from extensive groundwater	Applicant	The project applicant shall prepare and submit the specified plan according to the regulatory timeline for the landfill's Final Closure and Post-closure Maintenance Plan, prior to landfill closure.	Marin County EHS and RWQCB	Marin County EHS, CIWMB, and RWQCB, prior to landfill closure

REDWOOD LANDFILL SOLID WASTE FACILITIES PERMIT REVISION MITIGATION MONITORING AND REPORT PROGRAM (Continued)

IMPACT AND SIGNIFICANCE AFTER MITIGATION	MITIGATION	IMPLEMENTED BY	WHEN IMPLEMENTED	MONITORED BY	VERIFIED BY AND DATE
3.4.11 (cont.)	monitoring and Hydrologic Evaluation of Landfill Performance (HELP) model results may be necessary to demonstrate to the RWQCB that no significant groundwater impact will result from the proposed alternative final cover and liner. Pursuant to CEQA Guidelines, the revised Closure and Post-Closure Maintenance Plan will be subject to additional review under CEQA prior to approval.				
	3.4.11b: The applicant shall continue to implement the existing groundwater monitoring program for this area. If leachate is detected by the monitoring program, the applicant will implement appropriate measures to prevent the off-site release of such leachate. Such measures may include installation of an extraction well, pumping the detected leachate plume at a rate sufficient to prevent its release off-site, and disposing of the collected leachate at the 11-acre leachate pond. (Because this 11.5-acre waste unit does not have an LCRS trench system, remedial actions here would necessarily be different from those identified for the permitted landfill footprint under 3.4.7d, above.)	Applicant	The project applicant shall continue to implement this measure upon issuance of a revised SWRP.	Marin County EHS and RWQCB	Marin County EHS, CIWMB, RWQCB, ongoing
	3.4.11c: If the RWQCB or LEA determine that the applicant's revised Closure and Post-Closure Maintenance Plan for this waste unit is inadequate to protect groundwater quality, then the applicant shall excavate the refuse as previously proposed and dispose of it within the permitted landfill footprint. The estimated 65,000 cubic yards of refuse is equivalent to approximately 5 percent of the air space consumed annually, assuming the waste acceptance rate proposed under the project, or about 15 days' worth of landfill space (refer to Appendix A, Site Life Calculations).	Applicant	The applicant shall implement this measure upon the determination by the RWQCB or Marin County EHS following the agencies' review of Closure Post-Closure Maintenance Plan. If required, the project applicant shall complete the excavation within two years of the determination.	Marin County EHS and RWQCB	Marin County EHS, CIWMB, RWQCB, upon completion of review of Closure Post-Closure Maintenance Plan

REDWOOD LANDFILL SOLID WASTE FACILITIES PERMIT REVISION MITIGATION MONITORING AND REPORT PROGRAM (Continued)

IMPACT AND SIGNIFICANCE AFTER MITIGATION	MITIGATION	IMPLEMENTED BY	WHEN IMPLEMENTED	MONITORED BY	VERIFIED BY AND DATE
3.4.11 (cont.)	**3.4.11d:** Without mitigation, excavation of 65,000 cubic yards of refuse would have adverse impacts on air quality due to dust and equipment emissions. If Mitigation Measure 3.4.11c is required, it shall be implemented in conjunction with Mitigation Measures 3.2.1a-c, identified in this EIR, to reduce impacts of construction activities on air quality, and in conjunction with Mitigation Measures 3.2.2a-e, to reduce impacts associated with equipment and truck emissions of criteria air pollutants.	See referenced mitigation measures.			
3.4.12: Due to the increase of load pressure by waste placement and the decrease of pore water velocity during Bay Mud consolidation, a leachate mound could be created that will create sufficient uplift pressure on the landfill to trigger slope failure. (LTS)\	**3.4.12a:** As described under Impact 3.4.6 and 3.4.7, the applicant has proposed to install a LCRS around the perimeter of the landfill footprint and will continue to manage leachate in accordance with the facility's RWQCB-approved Leachate Management Plan. The LCRS will include a gravel-filled trench that is lined with a collection pipe and graded to sumps that are spaced along the trench alignment. The sumps are fitted with automatic level control pumping systems that are set to maintain an elevation of -1 feet MSL within the system, to promote the flow of leachate and outboard groundwater toward the LCRS trench (GeoSyntec, 1998). The LCRS will help to prevent leachate mounding within the landfill.	Applicant	The project applicant has completed installation of the LCRS and is implementing specified provisions. The project applicant shall continue to implement this measure upon issuance of the revised SWFP.	Marin County EHS and RWQCB	Marin County EHS, CIWMB, and RWQCB, periodically
	3.4.12b: If quarterly measurements of leachate elevations in leachate wells indicate that buildup is occurring, the results of geotechnical monitoring required under Impact 3.4.2 shall be evaluated to assess the effect of the leachate mound on slope stability. The assessment shall be conducted under the supervision of the geotechnical engineer familiar with landfill operations and the behavior of the underlying Bay Mud, as specified in Mitigation Measure 3.4.2b. If the geotechnical assessment determines that the leachate elevation needs to be reduced to maintain landfill stability, RLI will immediately undertake steps to reduce the height of the leachate mound. Measures that could be taken to reduce the height of the mound include	Applicant	The project applicant shall implement monitoring as specified for Measure 3.4.2 and shall implement measures to reduce leachate levels immediately upon detection of a problem as specified.	Marin County EHS and RWQCB	Marin County EHS, CIWMB, and RWQCB, as needed

REDWOOD LANDFILL SOLID WASTE FACILITIES PERMIT REVISION MITIGATION MONITORING AND REPORT PROGRAM (Continued)

IMPACT AND SIGNIFICANCE AFTER MITIGATION	MITIGATION	IMPLEMENTED BY	WHEN IMPLEMENTED	MONITORED BY	VERIFIED BY AND DATE
3.4.12 (cont.)	(1) increasing the rate of leachate removal by adjusting the settings on the automatic pumps in the perimeter sumps and in the landfill gas/leachate extraction wells to commence operation at lower leachate levels, and (2) implementation of Mitigation Measure 3.4.7e.				
3.4.13: Excess pore pressure resulting from infiltration of quench water for composting operations conducted on the permitted landfill area could cause slope instability. (LTS)	**3.4.13a:** All composting within the permitted landfill footprint shall be conducted on a low permeability pad that meets permeability specifications established by the RWQCB.	Applicant	The project applicant shall implement this measure upon issuance of revised SWFP.	Marin County EHS and RWQCB	Marin County EHS, CIWMB, and RWQCB, periodic inspections
	3.4.13b: Runoff from composting areas within the permitted landfill footprint shall be controlled and transmitted to the leachate collection pond or other leachate storage or treatment area.	Applicant	The project applicant shall implement this measure upon issuance of revised SWFP	Marin County EHS and RWQCB	Marin County EHS, CIWMB, and RWQCB, periodic inspections
	3.4.13c: The applicant shall comply with all provisions of CCR Title 14, §17865 and Subtitle D, 40 CFR 258.28a.	Applicant	The project applicant shall implement this measure upon issuance of revised SWFP	Marin County EHS and RWQCB	Marin County EHS, CIWMB, and RWQCB, periodic inspections
Hydrology and Water Quality					
3.5.1: Displacement of landfill slopes, the perimeter levee, or damage to the LCRS due to static or dynamic forces could allow leachate or refuse to reach and potentially contaminate surrounding surface water bodies, block adjacent drainages, or allow surrounding floodwaters to flood the landfill. (LTS)	**3.5.1a:** Implement Measures 3.4.1a and 1b (regarding RLI's Post Earthquake Inspection and Corrective Action Plan and ensuring that costs to remediate groundwater or surface water degradation resulting from earthquake-caused damage to landfill or levee slopes or the LCRS are financially assured), and Measure 3.4.2a (regarding utilization of criteria developed by GeoSyntec for monitoring the lateral and vertical deformation of Bay Mud to provide advance warning or potential landfill instability).	See referenced mitigation measures.			

REDWOOD LANDFILL SOLID WASTE FACILITIES PERMIT REVISION MITIGATION MONITORING AND REPORT PROGRAM (Continued)

IMPACT AND SIGNIFICANCE AFTER MITIGATION	MITIGATION	IMPLEMENTED BY	WHEN IMPLEMENTED	MONITORED BY	VERIFIED BY AND DATE
3.5.1 (cont.)	**3.5.1b:** Implement Measures 3.4.1c (i.e., update the facility's Post Earthquake Inspection and Corrective Action Plan to address changes resulting from the project), and Measures 3.4.2b (regarding the conduct and reporting of the geotechnical monitoring program), 3.4.2c (regarding actions to take in response to indications of an increasing rate of deformation in the monitored slopes), 3.4.2d (regarding the modification of the fill sequencing plan, as needed, if the strength of the Bay Mud is less than anticipated), and Measure 3.4.3 (regarding regular inspection for cracks in cover material and regular monitoring of pressure and volume changes in the landfill gas collection system).	See referenced mitigation measures.			
3.5.2: The off-site migration of landfill leachate could contaminate nearby surface waters. (LTS)	**3.5.2a:** Implement Mitigation Measures 3.4.7a (regarding the continued management of leachate in accordance with the landfill's RWQCB-approved leachate management plan), 3.4.7b (regarding RLI's preparation of a leachate facilities leak and spill contingency plan and regular monitoring of the leachate pond), 3.4.7c (regarding the immediate inspection of leachate pond containment facilities after any significant seismic or rainfall event, and actions to take if a major leak is evident), and 3.4.7d (regarding evaluation and development of a monitoring and corrective action program if the groundwater monitoring program detects leachate outside the perimeter levee), and Mitigation Measure 3.4.10a (regarding RLI's construction of a perimeter trench LCRS and augmentation of the LCRS by the pumping of leachate from wells in the interior of the landfill).	See referenced mitigation measures.			
	3.5.2b: Implement Mitigation Measure 3.4.7e (regarding the installation of a LCRS at Areas E and F and implementation of a pumping program in the interior of the landfill), Mitigation Measure 3.5.3b (to ensure that composting occurs on appropriate pads that are sufficiently impermeable), Mitigation Measure 3.5.3d (to ensure that contact water [leachate] from the proposed composting, co-composting, and sludge processing areas continues to be managed separately from non-contact runoff), and Mitigation Measure 3.4.7f (regarding the landfill's Leachate Facilities Leak or Spill Contingency Plan).	See referenced mitigation measures.			

REDWOOD LANDFILL SOLID WASTE FACILITIES PERMIT REVISION MITIGATION MONITORING AND REPORT PROGRAM (Continued)

IMPACT AND SIGNIFICANCE AFTER MITIGATION	MITIGATION	IMPLEMENTED BY	WHEN IMPLEMENTED	MONITORED BY	VERIFIED BY AND DATE
3.5.3: The proposal to no longer manage water that has contacted compost, co-compost, sludge, and materials proposed to be used as ADC, separately from non-contact water could degrade the water quality of the storm water impoundment and ultimately transport contaminants to off-site surface waters. (LTS)	**3.5.3a:** Outside of areas with a LCRS, future composting/co-composting activities will be conducted on appropriate composting pads to limit infiltration and to control run-off (GeoSyntec, 1998). Based on the applicant's "Comments and Project Clarification Discussion [on the project]" (RLI/WM, 2000), wet-weather composting will not take place in unlined areas. Thus, year-round composting will take place only on lined pads (i.e., lined with 2 feet of clay, as in Fields 1 and 2). Pads will be designed and constructed to promote surface drainage and prevent ponding. Portions of the composting pads may be surfaced with 6 to 12 inches of gravel, asphalt, or other suitable material to provide for all weather access (GeoSyntec, 1998). Dry-weather composting will be conducted on pads comprised of a minimum of either 1 foot of native soils or recompacted imported soils possessing a maximum saturated hydraulic conductivity of 1×10^{-6} centimeters per second.	Applicant	The project applicant shall implement this measure prior to issuance of a revised Composting Facilities Permit and revised WDRs.	Marin County EHS, RWQCB	EHS and RWQCB prior to issuance of revised permits
	3.5.3b: For composting operations outside the landfill footprint, including any operations in the area currently known as the main sludge impoundment, pads used for both wet weather and dry weather operations must meet permeability specifications established by the RWQCB. Although Bay Mud is generally a low-permeability soil, lenses of more permeable sand or organic material are known to occur within it. The applicant shall provide documentation to the RWQCB of site-specific studies documenting that areas proposed to be used for composting meet RWQCB specifications throughout the proposed area.	Applicant	The project applicant shall implement this measure prior to issuance of a revised Composting Facilities Permit and revised WDRs.	Marin County EHS, RWQCB	RWQCB prior to issuance of revised WDRs; periodic inspections
	3.5.3c: For composting or co-composting operations conducted on any portion of the landfill that already has a LCRS (i.e., within the permitted 223-acre landfill footprint), implement Mitigation Measure 3.4.13c (regarding Title 14 Section 17865 requirements for the siting of composting facilities on landfills). See also Impact 3.4.13 (regarding potential excess pore pressure resulting from the infiltration of quench water) in Section 3.4, Geology and Seismicity.	See referenced mitigation measures.			

REDWOOD LANDFILL SOLID WASTE FACILITIES PERMIT REVISION MITIGATION MONITORING AND REPORT PROGRAM (Continued)

IMPACT AND SIGNIFICANCE AFTER MITIGATION	MITIGATION	IMPLEMENTED BY	WHEN IMPLEMENTED	MONITORED BY	VERIFIED BY AND DATE
3.5.3 (cont.)	**3.5.3d:** To ensure storm water discharges do not contaminate off-site receiving waters, all contact water shall continue to be managed separately from non-contact water and retained on site. Storm water management shall include the following measures: 1. Composting operations areas outside of the landfill footprint, including areas used for active composting, stockpiling of feedstock and curing or finished compost, maturing piles, and other processing, shall be fitted with leachate collection systems, such as site grading and perimeter drain systems, that prevent pooling of liquids, that collect any free liquid, including leachate, excess quench water, and other liquids, and that convey the collected liquid to the leachate collection pond or other leachate treatment facility. 2. Areas used for wet season handling, storage, or stockpiling of dried sludge, materials to be used for ADC, or other materials capable of producing contaminated runoff shall be fitted with impermeable pads and leachate collections systems, or the materials themselves shall be protected from contact with rainwater.	Applicant	The project applicant shall construct specified leachate collection systems and submit to the Marin County EHS and RWQCB documentation demonstrating compliance with this measure prior to issuance of revised SWFP and revised WDRs. The applicant shall implement specified operational provisions upon issuance of the revised SWFP and/or revised WDRs.	Marin County EHS, RWQCB	EHS and RWQCB prior to issuance of revised permits, and continuing periodic inspections
3.5.4: Insufficient capacity to contain contact-water runoff from new areas proposed to be used for composting and co-composting would result in the off-site release of contact water and the potential degradation of nearby surface waters. (LTS)	**3.5.4:** The applicant shall produce and present to the LEA and RWQCB for approval a report demonstrating that sufficient capacity exists to contain contact water from areas outside the landfill footprint, proposed to be used for composting, co-composting and sludge processing, that would result from a 100-year storm event. Approval of use of these areas for composting, co-composting, and sludge processing shall be conditioned upon submittal and approval that this standard has been met. Because the amount of contact water generated at Redwood Landfill would increase as a result of the expanded	Applicant	The project applicant shall implement this measure as specified in Mitigation Measure 3.4.7f.	Marin County EHS, RWQCB	Marin County EHS and RWQCB, prior to issuance of revised permits; continuing periodic inspections of drainage facilities

REDWOOD LANDFILL SOLID WASTE FACILITIES PERMIT REVISION MITIGATION MONITORING AND REPORT PROGRAM (Continued)

IMPACT AND SIGNIFICANCE AFTER MITIGATION	MITIGATION	IMPLEMENTED BY	WHEN IMPLEMENTED	MONITORED BY	VERIFIED BY AND DATE
3.5.4 (cont.)	composting area, RLI will have to demonstrate to the satisfaction of the LEA and the RWQCB where, within the landfill boundaries, contact water from this area would be directed, and that such contact-water impoundment will have sufficient capacity to accommodate run-off from a 100-year storm event. Storage capacity shall be adequate to contain contact water generated from a storm occurring mid- or late-season, when the impoundment could have water in it from previous storms.				
3.5.5: The use of leachate as quench water could contaminate groundwater and surface water. (LTS)	**3.5.5a:** The applicant will test leachate to be used as quench water quarterly, consistent with current testing and use protocols applied to the use of leachate for dust control. The leachate will be used for quench water as long as, and only if, it meets RWQCB-approved standards established for the use of leachate for dust control at the site. This measure will be reflected as a requirement in the Solid Waste Facilities Permit as well as the landfill's Waste Discharge Requirements. The current program to reuse leachate for dust control, upon which the program to reuse leachate for quench water will be based, requires RLI to sample the leachate pond on a quarterly basis prior to use for dust control to insure that levels of chemical constituents are at "clean" standards. Reporting of the leachate sampling is included with the Self Monitoring Program associated with Redwood Landfill's Waste Discharge Requirements. Written detection monitoring reports, which include compliance evaluation summaries, are filed by the 15th day of the month following the report period; an annual report also is required, by January 31 for the previous calendar year.	Applicant	The project applicant shall implement this measure consistent with all RWQCB and WDR requirements upon issuance of the revised SWFP and/or revised WDRs. The project applicant shall submit reporting documentation as specified.	Marin County EHS, RWQCB	Marin County EHS and RWQCB, continuing periodic inspections
	3.5.5b: Implement Mitigation Measure 3.5.3a.	See referenced mitigation measures.			
	3.5.5c: Implement Mitigation Measures 3.5.3b, 3.5.3c, and 3.5.3d.	See referenced mitigation measures.			

REDWOOD LANDFILL SOLID WASTE FACILITIES PERMIT REVISION MITIGATION MONITORING AND REPORT PROGRAM (Continued)

IMPACT AND SIGNIFICANCE AFTER MITIGATION	MITIGATION	IMPLEMENTED BY	WHEN IMPLEMENTED	MONITORED BY	VERIFIED BY AND DATE
3.5.6: Areas outside the 223-acre landfill footprint, including areas proposed for composting and co-composting operations and the relocated administration facilities, are within the 100-year flood plain. (LTS)	**3.5.6a:** To ensure the site and project elements are protected from potential impacts of flooding, the applicant shall complete their planned increase in the height of the perimeter levee that encompasses the entire landfill site (i.e., the approximately 380 acres of the 420-acre Southern Area currently located within levees) to 9 feet above msl and their planned increase in the width of the perimeter levee to 10 feet prior to implementation of project elements in the Oxbow or other areas outside the permitted 223-acre landfill footprint. The applicant's Joint Technical Document (JTD) (GeoSyntec, 1998) states on page 4-21 that the perimeter levee is approximately four miles long and separates the site from adjacent sloughs. As part of the description of the existing facility (pages 5-1 and 5-2) the JTD states that the perimeter levee encompasses approximately 380 acres of the 420-acre Southern Area of the landfill property, and that the height of the perimeter levee will be increased to 9 feet above mean sea level around the entire landfill, and that the crest will be widened to 10 feet. These changes to the perimeter levee are not specified as project elements, and elsewhere in the JTD some ambiguity exists as to whether references to a perimeter levee refer to a levee around only the permitted landfill footprint (approximately 223 acres) or around the entire landfill site (approximately 380 acres of which are within existing levees). This analysis assumes that as part of the facility's existing operation, as stated on the aforementioned pages, RLI intends to increase the perimeter levee that encompasses the entire 380 acres of the 420-acre Southern Area to 9 feet above msl and to widen its crest to 10 feet. Because the base flood elevation for the 100-year storm is 6 to 7 feet ngvd (approximately equivalent to mean sea level), increasing the levee to 9 feet would protect the	Applicant	The project applicant shall commence implementation of this measure, consistent with other measures pertaining to adequate stability analyses, upon issuance of the revised SWFP. However, as specified in the mitigation measure, the first phase of levee improvements must be completed by January 1, 2010. Timing of the completion of specified levee improvements is expected to be governed by geotechnical limitations of construction on Bay Mud, as discussed in the text of the mitigation measure.	Marin County EHS	Marin County EHS and RWQCB prior to issuance of revised permits; continuing periodic inspections

REDWOOD LANDFILL SOLID WASTE FACILITIES PERMIT REVISION
MITIGATION MONITORING AND REPORT PROGRAM (Continued)

IMPACT AND SIGNIFICANCE AFTER MITIGATION	MITIGATION	IMPLEMENTED BY	WHEN IMPLEMENTED	MONITORED BY	VERIFIED BY AND DATE
3.5.6 (cont.)	landfill property from the 100-year flood. Increasing the width should contribute support to the levee's stability and ability to withstand the dynamic forces of the river at flood stage. The 223-acre landfill footprint already is located outside the 100-year flood plain due to existing levees. The portion of the site outside the landfill footprint remains vulnerable to flooding until these planned changes to the perimeter levee are completed. The applicant shall prepare and adhere to a construction schedule for completion of the levee improvements specified above. The construction schedule must be prepared and submitted to the LEA prior to project approval and issuance of a revised SWFP. It is expected that the construction schedule will indicate that phased or sequenced construction is required, in order to allow consolidation and strengthening of the Bay Mud beneath the levee (see Mitigation Measure 3.5.6b and 3.5.6c, below). The construction schedule must show that all planned improvements of the entire levee system will be completed no later than January 1, 2010, or, if phased or sequenced construction is required, completion of the first phase or sequence by this date. The first phase or sequence must include improvements to any and all parts of the perimeter levee that encompasses the entire 380 acres of the 420-acre Southern Area that are not yet at the design elevation of +9 feet msl and the design top width of 10 feet. The construction schedule shall further indicate that completion of all phases or sequences will be completed in the shortest feasible time, given the limitations of construction on Bay Mud. The construction schedule shall be peer reviewed, at the applicant's expense, by a Registered Geotechnical Engineer selected or approved by Marin County. The construction schedule shall become a condition of the revised Solid Waste Facility Permit.				

REDWOOD LANDFILL SOLID WASTE FACILITIES PERMIT REVISION MITIGATION MONITORING AND REPORT PROGRAM (Continued)

IMPACT AND SIGNIFICANCE AFTER MITIGATION	MITIGATION	IMPLEMENTED BY	WHEN IMPLEMENTED	MONITORED BY	VERIFIED BY AND DATE
3.5.6 (cont.)	**3.5.6b:** The applicant shall conduct slope stability analyses of the recently completed levee upgrades to determine whether the factor of safety is adequate for static and dynamic stability. The slope stability analyses shall utilize the methods and factors recommended by GeoSyntec (2007d), and shall take into account site-specific differences in surface and subsurface conditions. The same analyses shall be applied to designs for future levee upgrades. All analyses shall be independently peer reviewed by a Registered Geotechnical Engineer at the Applicant's expense and subject to approval by the LEA or, if subsequent work requires a Grading Permit, by the Marin County Department of Public Works, or, if a building permit is required, by the Community Development Agency Building and Safety Division. If analysis of the recently-completed levee sections reveals that they do not meet minimum static factor of safety and seismic performance standards, the applicant shall develop a remedial action plan for further levee improvements. Any such plan shall be independently peer reviewed by a Registered Geotechnical Engineer at the applicant's expense and subject to approval by the LEA or the Marin County Department of Public Works or Community Development Agency Building and Safety Division. <u>The schedule for implementation of the remedial action plan shall be included in the construction schedule and subject to the same requirements specified in Mitigation Measure 3.5.6a, above.</u>	Applicant	The project applicant shall complete and submit initial specified analysis prior to project approval. The project applicant shall implement the remedial action plan, if required, within 2 months of completion of stability analyses making the determination specified standards are not met.	Marin County EHS, RWQCB	Marin County EHS, RWQCB, and Marin CoDPW or Marin County CDA as applicable
	3.5.6c: The applicant shall re-analyze the stability analysis contained in the remedial action plan for the failed levee segment, per the recommendations of Treadwell and Rollo's peer review (Appendix F). All analyses shall be independently peer reviewed by a Registered Geotechnical Engineer at the applicant's expense and subject to approval by the LEA, or, if a Grading Permit or a Building Permit is required, by the Marin County Department of Public Works or Community Development Agency Building and Safety	Applicant	The project applicant shall implement this measure prior to project approval.	Marin County EHS, RWQCB	Marin County EHS, CIWMB, RWQCB

REDWOOD LANDFILL SOLID WASTE FACILITIES PERMIT REVISION MITIGATION MONITORING AND REPORT PROGRAM (Continued)

IMPACT AND SIGNIFICANCE AFTER MITIGATION	MITIGATION	IMPLEMENTED BY	WHEN IMPLEMENTED	MONITORED BY	VERIFIED BY AND DATE
3.5.6 (cont.)	Division, respectively. If the new analysis reveals that the design contained in the remedial action plan does not achieve an acceptable static factor of safety and seismic performance standard, the applicant shall develop a new design for the levee repair. This may require, for example, use of higher sheet piles as a parapet wall along the creek to provide flood protection, with the earthen fill and roadway placed at a lower elevation to reduce the static load on the Bay Mud. Any new design shall be independently peer reviewed by a Registered Geotechnical Engineer and subject to approval by the Marin County Department of Public Works. The schedule for implementation of the new design shall be included in the construction schedule and subject to the same requirements specified in Mitigation Measure 3.5.6a, above.				
	3.5.6d: Prior to ~~Within 2 years of~~ project approval, the applicant shall prepare and submit to the LEA and the San Francisco Bay Regional Water Quality Control Board a plan for long-term flood protection of the site. The plan will include a consideration of feasible options for achieving protection from the 100-year flood in the face of rising sea level and increased flood frequency and intensity. The plan shall include selection of the preferred method or methods for achieving flood protection, and both a schedule and financial assurances for their implementation. The engineering basis for the plan shall be independently peer reviewed by a Registered Geotechnical Engineer prior to submittal for approval. The plan will be drafted and then updated every 5 years during the remaining operational life of the landfill and the post-closure maintenance period to ensure that it is current with the most recent and broadly-accepted predictions for flood levels, following consultation with the U.S. Geological Survey, the San Francisco Bay Conservation and Development Commission, and other monitoring agencies that track bay and ocean levels and that may provide estimates of mean sea level rise and areas subject to future inundation. Implementation of the plan shall become a condition of the revised SWFP.	Applicant	The project applicant shall implement this measure as specified.	Marin County EHS, RWQCB	Marin County EHS, RWQCB, upon receipt of plan and periodically as specified

REDWOOD LANDFILL SOLID WASTE FACILITIES PERMIT REVISION MITIGATION MONITORING AND REPORT PROGRAM (Continued)

IMPACT AND SIGNIFICANCE AFTER MITIGATION	MITIGATION	IMPLEMENTED BY	WHEN IMPLEMENTED	MONITORED BY	VERIFIED BY AND DATE
3.5.7: If surface water drainage systems are not properly managed, storm water contacting the landfill surface could erode landfill cover materials and cause the sedimentation of onsite drainage systems, and potentially, the sedimentation and/or contamination of off-site receiving surface waters. (LTS)	**3.5.7:** Implement Mitigation Measures 3.4.4a, 4b, 4c, and 4d (to implement an updated SWPPP and prepare and eventually implement a final closure and post-closure maintenance plan). As discussed under Impact 3.4.4 in Section 3.4, Geology, Soils, and Seismicity, implementation of these measures would reduce the potential impacts of storm-generated erosion and help ensure the proper management of the site's drainage system. Implementation of these measure, combined with requirements specified in Title 27 for precipitation and drainage controls as well as the existing drainage facilities and management practices at the landfill would reduce this impact to a less-than-significant level.	See referenced mitigation measures.			
3.5.8: Construction activities, including grading and related activities at the proposed composting areas could increase soil erosion and result in the transport of sediments and other contaminants to off-site surface waters. (LTS)	**3.5.8:** Prior to construction, the applicant will prepare a construction Storm Water Pollution Prevention Plan (SWPPP) to minimize impacts to storm water runoff quality from construction activities. The construction SWPPP will be kept on site and available to RWQCB and LEA staff upon request.	Applicant	The project applicant shall implement this measure prior to issuance of revised WDRs and prior to construction activities at the site.	RWQCB	RWQCB; periodically
3.5.9: The existing drainage system may be insufficient to accommodate the 100-year, 24-hour precipitation event required of Class III landfills. (Significant)	**3.5.9:** The applicant shall produce and present to the RWQCB for approval a report demonstrating that sufficient capacity exists in the precipitation and drainage control facilities to accommodate the 100-year 24-hour precipitation event as required by Title 27. A copy of the report shall also be provided to the LEA. The report shall include information about the anticipated elevation of flows in San Antonio Creek during the 100-year flood; if existing and any new discharge outlets to San Antonio Creek are below this elevation, such drains shall be equipped with flap gates to existing drains are equipped to prevent flood tides from prevent flood waters from entering the outlets, as two entering. The final engineering design specifications for the permanent and major temporary drainage facilities capable of meeting the requirements specified in Title 27, Table 4.1	Applicant	The project applicant shall implement this measure prior to issuance of a revised SWFP or revised WDRs.	RWQCB	CIWMB, Marin County EHS and RWQCB

REDWOOD LANDFILL SOLID WASTE FACILITIES PERMIT REVISION MITIGATION MONITORING AND REPORT PROGRAM (Continued)

IMPACT AND SIGNIFICANCE AFTER MITIGATION	MITIGATION	IMPLEMENTED BY	WHEN IMPLEMENTED	MONITORED BY	VERIFIED BY AND DATE
3.5.9 (cont.)	shall be developed by a registered engineer and shall include drainage facilities for all areas of the landfill property. These specifications shall become part of the project.				
3.5.10: The proposed use of various alternative daily cover (ADC) materials could have an adverse impact on water quality. (LTS)	**3.5.10a:** As described under "working face operations in wet weather" in Redwood Landfill's current Storm Water Pollution Prevention Plan (Redwood Landfill, 2000), when rain occurs or is forecast or imminent, RLI shall cover the ADC applied that day with impermeable tarps to prevent rainwater contact with the ADC.	Applicant	The project applicant shall continue to implement this measure upon issuance of the revised SWFP.	Marin County EHS, RWQCB	Marin County EHS and RWQCB, continuing periodic inspections
	3.5.10b: Soil shall continue to be used as the cover material on any day preceding closed days (e.g., Saturdays~~)~~; ADC may continue to be used as the daily cover the rest of the week (i.e., Monday through Friday; the landfill is closed on Sunday).	Applicant	The project applicant shall implement this measure upon issuance of the revised SWFP.	Marin County EHS, RWQCB	Marin County EHS and RWQCB, continuing periodic inspections
	3.5.10c: In conjunction with implementing Mitigation Measure 3.5.3, above, water contacting ADC shall be considered, and managed as, contact water. Thus water contacting ADC shall be managed separately from non-contact water and retained on site.	Applicant	The project applicant shall implement this measure upon issuance of the revised SWFP.	Marin County EHS, RWQCB	Marin County EHS and RWQCB, continuing periodic inspections
Land Use					
3.6.2: Development of the proposed project could result in conflicts with operations at Gnoss Field. (LTS)	**3.6.2a:** The applicant proposes to continue their existing bird control program. Redwood Landfill's bird control program focuses on gulls, the predominant avian scavengers at the site, and consists of using pyrotechnic devices to discourage gulls from landing or circling overhead during refuse placement and compaction. The devices provide noise (bang or whistle), a flash of light, smoke, and the sound of the propellant. RLI focuses its deterrent efforts when the birds first begin to arrive in the morning (shortly after dawn) and the morning hours, having found that this results in fewer gulls approaching the site during the rest of the day. RLI also may use a gas-fired cannon, which emits a loud blast, in conjunction with the pyrotechnic devices. Redwood Landfill periodically re-evaluates and revises bird control techniques as necessary.	Applicant	The project applicant shall continue to implement this measure, consistent with other applicable mitigation measures, upon issuance of the revised SWFP.	Marin County EHS	Marin County EHS, continuing periodic inspections

REDWOOD LANDFILL SOLID WASTE FACILITIES PERMIT REVISION MITIGATION MONITORING AND REPORT PROGRAM (Continued)

IMPACT AND SIGNIFICANCE AFTER MITIGATION	MITIGATION	IMPLEMENTED BY	WHEN IMPLEMENTED	MONITORED BY	VERIFIED BY AND DATE
3.6.2 (cont.)	**3.6.2b:** The applicant proposes no change in the number or type of lights used for nighttime operations. There are no records that indicate that the existing use of lights at the landfill poses a hazard to operations at Gnoss Field.	Applicant	The project applicant shall implement this measure, consistent with other applicable mitigation measures, upon issuance of the revised SWFP.	Marin County EHS, Marin County ALUC	Marin County CDA-Planning, EHS and ALUC; periodically by EHS
	3.6.2c: To ensure that nighttime activities do not interfere with operations at Gnoss Field, lights used during nighttime landfill operations will not be colored, will be shielded and directed downward to reduce glare, and will be placed in an irregular pattern in order not to appear to be a runway. The applicant shall notify the Gnoss Field Airport prior to any change in the way lighting is used for nighttime operations.	Applicant	The project applicant shall implement this measure upon issuance of the revised SWFP. The project applicant shall notify Gnoss Field of changes to lighting prior to implementation of such changes.	Marin County EHS, Marin County ALUC	Marin County EHS, periodic inspections; and Marin County ALUC following notification of plan to revise use of lighting
	3.6.2d: If bird activity at the landfill, including the areas outside the permitted landfill footprint proposed for composting, increases as a result of the project, as determined by the LEA during regular site inspections, RLI shall adjust its existing bird control program as necessary to ensure that the facility does not pose a bird hazard to aircraft. RLI shall modify as necessary the demonstration required in 40 CFR Part 258, §258.10 (a) and 27 CCR, §20270(a) (that the landfill does not pose a bird hazard to aircraft).	Applicant	The project applicant shall implement this measure immediately upon notification of a determination by the EHS that such revision is necessary.	Marin County EHS, Marin County ALUC	Marin County EHS, Marin County ALUC, as needed
3.6.4: The project would conflict with Goals 1, 6, and 9 of the Source Reduction and Recycling Element of the Integrated Waste Management Plan for Marin County and its Cities. (S)	**3.6.4a:** The applicant is proposing to increase the capacity of the existing composting/co-composting facility.	Applicant	The project applicant shall implement this measure upon issuance of revised Composting Facilities Permit for the proposed increase in capacity.	Marin County EHS	Marin County EHS, continuing periodic inspections

REDWOOD LANDFILL SOLID WASTE FACILITIES PERMIT REVISION MITIGATION MONITORING AND REPORT PROGRAM (Continued)

IMPACT AND SIGNIFICANCE AFTER MITIGATION	MITIGATION	IMPLEMENTED BY	WHEN IMPLEMENTED	MONITORED BY	VERIFIED BY AND DATE
3.6.4 (cont.)	**3.6.4b:** The following measures will be required as conditions of a revised Solid Waste Facilities Permit, or through other actions, as noted: • RLI will be required upon issuance of the revised Solid Waste Facilities Permit (SWFP) to implement additional diversion programs at the landfill, such as construction and demolition debris recovery, recovery of materials from self-haul and debris box loads, salvage of building materials and other reusable items, increased opportunity for drop-off of source-separated materials, and other measures as detailed in the Mitigated Alternative, ~~(see Chapter 5)~~ consistent with the goals of the County's Source Reduction and Recycling Element as well as Goal PFS-4 and its associated policies and implementing programs in the Countywide Plan Update (see Table 1.2 in the FEIR RTC Amendment). Prior to project approval, the applicant shall prepare an implementation schedule for these programs that demonstrates that all new and improved facilities will be operational within 3 years of issuance of the revised SWFP. The implementation schedule shall be included in the revised SWFP as a condition of approval; • The County will consider the enactment of an ordinance that would impose a mitigation fee or similar strategy on waste imported to Redwood Landfill from areas of California outside Marin County. The mitigation fee will be used to develop additional landfill capacity in another location, and to develop new or expanded waste diversion programs~~., and to offset other project impacts, including significant, unavoidable air quality impacts (see Section 3.2, Air Quality and Chapter 4, Cumulative Impacts).~~	Applicant, Marin County Board of Supervisors	The project applicant shall implement the specified diversion programs upon issuance of the revised SWFP. The Marin County Board of Supervisors will consider the enactment of a mitigation fee ordinance in conjunction with the LEA's issuance of the revised SWFP.	Marin County EHS and Board of Supervisors	Marin County EHS and Board of Supervisors, ongoing

REDWOOD LANDFILL SOLID WASTE FACILITIES PERMIT REVISION MITIGATION MONITORING AND REPORT PROGRAM (Continued)

IMPACT AND SIGNIFICANCE AFTER MITIGATION	MITIGATION	IMPLEMENTED BY	WHEN IMPLEMENTED	MONITORED BY	VERIFIED BY AND DATE
3.6.5: The project would conflict with Summary Plan Goal 12, which is to insure that all residents of Marin County have access to a program that safely and effectively manages household hazardous waste, and Summary Plan Policy 14, to develop an effective program for managing household hazardous waste generated in the county. (LTS)	**3.6.5a:** RLI currently accepts used motor oil and automotive batteries at the landfill, and does not plan to discontinue this service.	Applicant	The project applicant shall continue to implement this measure upon issuance of the revised SWFP.	Marin County EHS	Marin County EHS, continuing periodic inspections
	3.6.5b: Redwood Landfill shall provide facilities for residents to drop-off oil filters, antifreeze, fluorescent light tubes, latex paint, and cathode ray tubes, in addition to used motor oil and automotive batteries, which are currently accepted.	Applicant	The project applicant shall submit a facility plan for the receipt of the specified materials within 1 year of issuance of the revised SWFP. The plan may require additional CEQA review.	Marin County EHS, CDA-Planning, Marin County Solid and Hazardous Waste Joint Powers Authority	CIWMB and DTSC, Marin County EHS; CDA-Planning.
Noise					
3.7.3: Use of equipment for composting operations in the Oxbow area and other areas proposed for composting operations could cause an increase in the ambient noise level for adjacent land uses. (LTS)	**3.7.3a:** Operating hours for the tubgrinder shall be restricted to 7 a.m. to 7 p.m.	Applicant	The project applicant shall implement this measure, consistent with other applicable measures, upon issuance of the revised SWFP.	Marin County EHS	Marin County EHS, continuing periodic inspections
	3.7.3b: The tubgrinder shall be operated at least 600 feet from the outer edge (creek side) of the road along the perimeter levee.	Applicant	The project applicant shall implement this measure upon issuance of the revised SWFP.	Marin County EHS	Marin County EHS, continuing periodic inspections
	3.7.3c: Alternatively, the landfill operator could construct an earthen berm between the tubgrinder operations area and all parts of the eastern landfill boundary within 600 feet of the tubgrinder location. The earthen berm must be at least as high as the highest part of the tubgrinder itself. Compost windrows could be substituted for the earthen berm, as long	Applicant	The project applicant shall implement this measure prior to use of the tubgrinder less than 600 feet from the outer edge (creek side)	Marin County EHS	Marin County EHS, continuing periodic inspections

REDWOOD LANDFILL SOLID WASTE FACILITIES PERMIT REVISION MITIGATION MONITORING AND REPORT PROGRAM (Continued)

IMPACT AND SIGNIFICANCE AFTER MITIGATION	MITIGATION	IMPLEMENTED BY	WHEN IMPLEMENTED	MONITORED BY	VERIFIED BY AND DATE
3.7.3 (cont.)	as they are as high as the highest part of the tubgrinder, and located between the tubgrinder operations area and the eastern landfill boundary.		of the road along the perimeter levee.		
Public Health and Safety					
3.8.1: Receipt of designated wastes, in particular, spill or upset conditions resulting from the receipt and handling of designated wastes, could expose site workers or the general public to unacceptable contaminant levels. (LTS)	**3.8.1a:** The project applicant has prepared and implements a worker health and safety program.	Applicant	The project applicant shall continue to implement this measure upon issuance of the revised SWFP.	Marin County EHS	Marin County EHS, continuing periodic inspections
	3.8.1b: Implement Mitigation Measure 3.2.10b (limit acceptance of designated wastes currently accepted at the landfill to the currently permitted level of 20 TPD) which . would reduce to a less-than-significant level the potential for workers or members of the public using the facility to be exposed to unacceptable contaminant levels associated with the landfill's receipt of designated wastes.	See referenced mitigation measures.			
3.8.2: Expanding the composting operations could increase the health threat to workers from exposure to *Aspergillus fumigatus* and endotoxins. (LTS)	**3.8.2a:** Redwood Landfill's existing composting operation includes dust control measures, such as the addition of water (using a water truck or portable sprinkler system) to composting windrows as needed to control dust and to maintain the appropriate moisture content for the composting process (GeoSyntec, 1998). Because bioaerosols and endotoxins are both carried on dust particles (particulate matter), measures to control dust at Redwood Landfill also will help limit the dispersal of *Aspergillus fumigatus* and endotoxins.	Applicant	The project applicant shall continue to implement this measure upon issuance of the revised SWFP.	Marin County EHS	Marin County EHS, continuing periodic inspections
	3.8.2b: Implement Mitigation Measure 3.2-4 (development and implementation of a Dust Mitigation Plan/Program).	See referenced mitigation measures.			
	3.8.2c: The project applicant shall follow sound composting management practices, including maintaining moisture, temperature and pH levels, and properly aerating, turning and mixing the composting materials. Specifically, the following practices will help minimize the generation	Applicant	The project applicant shall implement this measure upon issuance of the revised SWFP.	Marin County EHS	Marin County EHS, continuing periodic inspections

REDWOOD LANDFILL SOLID WASTE FACILITIES PERMIT REVISION MITIGATION MONITORING AND REPORT PROGRAM (Continued)

IMPACT AND SIGNIFICANCE AFTER MITIGATION	MITIGATION	IMPLEMENTED BY	WHEN IMPLEMENTED	MONITORED BY	VERIFIED BY AND DATE
3.8.2 (cont.)	and dispersal of dust and fungus spores during composting operations and thus limit exposure: • Refrain from turning, screening, or loading activities on windy days; • Use water sprays or mists during grinding, screening, and pile turning activities; • Maintain proper moisture levels in active composting piles; • Maintain good housekeeping practices, including site cleanliness; and • Provide employee training and the use of personal protective equipment.				
3.8.3: The proposed changes to the management of water that has contacted sludge and composting and co-composting materials could degrade water quality and impact public health. (LTS)	**3.8.3:** Implement Mitigation Measures 3.5.3a, 3.5.3b, 3.5.3c, and 3.5.3d regarding the conduct of composting outside and within the permitted landfill footprint and the management of contact water and storm water.	See referenced mitigation measures.			
3.8.4: Landfill gas migrating from the 11.5-acre waste unit in the southwest corner of the site could become trapped beneath the nearby relocated administration building and accumulate to explosive levels. (LTS)	**3.8.4:** The project applicant shall continue to implement the continuous monitoring of landfill gas levels in the relocated administration building, as is currently the practice at the existing administration building. Continuous monitoring is conducted using a GasTech gas sensing device and alarm system. In addition, the other existing gas monitoring programs at the landfill site shall be reviewed and modified if necessary to include monitoring of the 11.5-acre waste unit. The other monitoring includes quarterly monitoring by an outside consultant using portable gas detection equipment and weekly monitoring by RLI using a GasTech combustible gas indicator, in accordance with the terms of the landfill's Permit to Operate from BAAQMD.	Applicant	The project applicant shall continue to implement this measure upon issuance of the revised SWFP.	Marin County EHS	Marin County EHS, continuing periodic inspections

REDWOOD LANDFILL SOLID WASTE FACILITIES PERMIT REVISION MITIGATION MONITORING AND REPORT PROGRAM (Continued)

IMPACT AND SIGNIFICANCE AFTER MITIGATION	MITIGATION	IMPLEMENTED BY	WHEN IMPLEMENTED	MONITORED BY	VERIFIED BY AND DATE
3.8.5: Increased refuse and composting throughput could result in increases in gulls and other scavenging birds at the site, thus increasing the risk of bird strikes for aircraft approaching or departing from the nearby County airport, Gnoss Field. (LTS)	**3.8.5:** Implement Mitigation Measure 3.6.2d (i.e., modification of RLI's bird control program if needed to address increased bird activity at the site).	See referenced mitigation measures.			
Public Services, Utilities and Energy					
3.9.1: The proposed increase in composting throughput could increase the risk of fire occurring at the composting facility. (LTS)	**3.9.1:** For composting operations in new areas of the project site, RLI shall adhere to management practices established in the Registration Permit for the current composting operation and the terms and conditions established for the green waste and food waste pilot program.	Applicant	The project applicant shall implement this measure upon commencement of composting operations in new areas of the project site.	Marin County EHS	Marin County EHS, continuing periodic inspections following expansion of composting operations
3.9.2: The proposed increase in composting operations could place burdensome demands on public water supplies, exceeding available capacity, especially during periods of drought. (LTS)	**3.9.2:** During periods of drought RLI shall use only water from non-potable sources for dust control and/or quench water for the expanded composting operation.	Applicant	The project applicant shall implement this measure upon issuance of any voluntary water conservation order by the North Marin Water District.	Marin County EHS	Marin County EHS, continuing periodic inspections during declared drought periods
3.9.3: On-site activities, primarily the increased use of landfill equipment and vehicles, would increase energy consumption. (S)	**3.9.3a:** RLI shall apply to the BAAQMD for Authority to Construct power generation engines capable of producing four to five megawatts of power within two years of concurrence on the revised SWFP by the CIWMB.). .	Applicant	The project applicant shall implement this measure within two years of concurrence on the revised SWFP by the CIWMB.	Marin County EHS and BAAQMD	Marin County EHS and BAAQMD, upon notification by applicant of implementation

REDWOOD LANDFILL SOLID WASTE FACILITIES PERMIT REVISION MITIGATION MONITORING AND REPORT PROGRAM (Continued)

IMPACT AND SIGNIFICANCE AFTER MITIGATION	MITIGATION	IMPLEMENTED BY	WHEN IMPLEMENTED	MONITORED BY	VERIFIED BY AND DATE
3.9.3 (cont.)	**3.9.3b:** Implement Mitigation Measures 3.2.5c and 3.2.5e (apply for an authority to construct power generation engines with a capacity to produce four to five megawatts of power within two years of concurrence on the revised SWFP by the CIWMB, and apply for a Permit to Operate the engines.) Consistent with County policies regarding best energy management practices, RLI shall commence operation of these engines as soon as allowed by the Bay Area Air Quality Management District ~~possible~~. The experience of other landfills indicates that electricity generated by the landfill gas could replace (partly or entirely) electricity currently provided by PG&E, and eventually (if not immediately) provide sufficient power to be sold to offsite users. The use of landfill gas to provide for the facility's electricity needs would serve to offset partly the increased consumption of diesel fuel for project operations.	See referenced mitigation measures.			
	The applicant also shall install additional power generation engines in order to offset some use of the LFG flare. Currently, use of the flare is required to abate the emission of all collected LFG. ~~except the relatively small amount used by the leachate vaporator, as well as to destroy the vapor produced by the vaporator.~~ The flare also could potentially be used to destroy exhaust emissions from ~~the vaporator and the future~~ power generation engines. However, rather than using the flare at full capacity as the generation of LFG increases, an increasing share of LFG shall ~~could~~ be diverted to generate additional electrical power if additional generation engines were installed. Even with the additional power generation engines installed, some use of the flare ~~will~~ may continue to be required. ~~, for final destruction of leachate vapor as well as for destruction of combustion exhaust emissions from the vaporator and, potentially, from the power generation engines.~~ However, operation of additional power generation engines ~~potentially~~ would provide a more productive use of much of the collected LFG than simply flaring it. Prior to project approval, the applicant shall prepare a schedule, based on	Applicant	The project applicant shall install additional power general engines upon issuance of the required permits by BAAQMD (an Authority to Construct followed by a Permit to Operate). The project applicant shall apply to the BAAQMD for such permits as soon as LFG generation rates approach, or, at the latest, reach the capacity of the power generation engines specified in Measures 3.2.5c and3.2.5e. Installation	Marin County EHS, BAAQMD	Marin County EHS and BAAQMD, upon notification by applicant of implementation

REDWOOD LANDFILL SOLID WASTE FACILITIES PERMIT REVISION MITIGATION MONITORING AND REPORT PROGRAM (Continued)

IMPACT AND SIGNIFICANCE AFTER MITIGATION	MITIGATION	IMPLEMENTED BY	WHEN IMPLEMENTED	MONITORED BY	VERIFIED BY AND DATE
3.9.3 (cont.)	projected landfill gas generation rates, for the installation of additional power generation capacity. This schedule shall become a condition of the revised SWFP.		of additional power generation capacity shall be accomplished according to the schedule specified in the mitigation measure; the schedule shall be prepared and submitted prior to project approval.		
Cumulative Impacts					
CU-2: The project would incrementally add to cumulative air pollutant emissions. (Significant)	**CU-2a:** Implement Mitigation Measure 3.2.1a.	See referenced mitigation measures.			
	CU-2b: Implementation of the following mitigation measures, identified in Section 3.2, Air Quality, to mitigate project impacts concerning air pollutant emissions, also would help to mitigate the project's contribution to the cumulative impact: Mitigation Measure 3.2.2 (a-d) to reduce impacts from the increased equipment and truck operations associated with the proposed increase in incoming materials, Mitigation Measure 3.2.4 to reduce levels of project-generated fugitive dust, Mitigation Measure 3.2.5 (a-e) to address landfill gas emissions, Mitigation Measure 3.2.6 (a-d) to address ROG emissions from the proposed composting operation, and Mitigation Measure 3.2.10 (b or c) to address VOCs and odor from the air drying of sludge.	See referenced mitigation measures.			

KEY:

Significance After Mitigation

LTS = Mitigated to a less-than-significant level
SU = Significant and unavoidable

Monitored By:

ALUC = Airport Land Use Commission
BAAQMD = Bay Area Air Quality Management District
CDA-Planning = Marin Community Development Agency – Planning Division
CDFG = California Department of Fish and Game
CIWMB = California Integrated Waste Management Board
DTSC = California Department of Toxic Substances Control
EHS = Marin County Environmental Health Services Division
RWQCB = Regional Water Quality Control Board, San Francisco Bay Region
USFWS = U.S. Fish and Wildlife Service